MID-PACIFIC MAGAZINE

April-June, 1936

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of the

PAN-PACIFIC UNION

GEORGE MELLEN, Editor

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San Francisco the Improbable

By GELETT BURGESS

With illustrations from photographs selected by The Editors.

EACH one of us cherishes openly or in secret an Ideal. It may be dynamically expressed or it may rest inert in some *sanctum sanctorum* below the level of consciousness. But when that ideal is encountered in life we realize that thrill which is called Romance. And my first Romance I found in San Francisco.

Perhaps it was my puritanical though enlightened training in Boston, the legacy of generations of Mayflower ancestors, which made me feel, by vivid contrast, the freedom, the sincerity and the simplicity of life in the city by the Golden Gate. Proselytes are notoriously fanatical. Perhaps it was the climate, the same, we used to say, as that of Greece and of Japan, most favorable to art expression and individualism. But primarily it was the unique physical character of the gray city on its hills, almost surrounded by water. And so, as I am going to piece together a picture of what San Francisco meant to me in the purple '90's from my novel, The Heart Line, written while my impressions were fresh, let me begin with a sketch of the growth of the old Mission town.

Here was the ideal site for a city—a peninsula lying like a great thumb on the hand of the mainland between the Pacific Ocean and a deep, land-locked bay, an area romantically configured of hills and valleys, with picturesque mountain and water views, the setting sun in the broad Pacific and Mount Diablo a sentinel in the east; to the northward, the sea channel of the Golden Gate overhung by the foothills of Tamalpais.

The old town of Yerba Buena was a little Spanish settlement by the cove in the harbor. Its straight, narrow streets had been artlessly ruled by Francisco de Haro, alcalde of the Mission Dolores. He had marked out upon the ground, northerly, La Calle de la Fundacion and the adjacent squares necessary for the little port of entry in 1835. Four years later, when Governor Alvarado directed a new survey of the place, Jean Vioget extended the original lines with mathematical precision to the hills surrounding the valley. In 1846 it would still have been possible partly to correct that artistic blunder of the simple-minded alcalde. But Jasper O'Farrell, the civil engineer, had seen military service with General Sutter; his ways

Looking northward from Russian Hill across San Francisco Bay to Sausilito, left distance, and, right, Alcatraz Island. To the right of towering new apartment houses lies the Latin Quarter comprising areas and features identified with San Francisco's romantic night life since early days. Still farther to the right, out of the picture ,is the downtown business district.

were stern and severe, his esthetic impulses, if he had any, were heroically subdued. Market Street, indeed, he permitted to run obliquely, though it went straight as a bullet towards the Twin Peaks. The rest of the city he made one great checkerboard of right-angled streets in defiance of its natural topography.

O'Farrell knew no compromise. His streets took their straight and narrow way, up hill and down dale, without regard to grade or expense. Where might have been entrancingly beautiful terraces, rising avenue above avenue to the heights, preserving the master-view of the continent, the streets are hacked out of the earth and rock, precipitous, grotesque. So sprawls the fey, leaden-colored town over its dozen hills.

San Francisco, the Improbable! Its pageantry is unrolled for all to see at first glance. In every little valley where the slack, rattling cables of her car lines slap and splutter over the pulleys, some great area of the town exhibits a rising colony of blocks of wooden houses stretching up and over a shoulder of the hill. Atop every crest one is confronted with farther districts lying beneath and rising opposite with rival summits. As you are whirled up and down on the cable car, the city moves stealthily about you in valleys and steep declivities. Now she is all waterfront and sailors' lodging houses and dance halls; in a trice she turns sandy Chinatown; then shocks you with a Spanish, Italian or negro quarter and then surprises you with a terrifying ascent crowned with palaces. Past the next rise you find her whimsical, fantastic with garish flats and apartment houses. She lurks in and about thousands of little wooden houses, and beyond, she drops a little park into your path, discloses a stretch of shimmering bay or unveils magnificently the green, gently-sloping expanse of the noble Presidio.

No other city has so many points of view, none allures with such originality, even oddity. Some cities have single dominant hills. Rome has seven; but San Francisco is all hills. They mount north and west and must be climbed. The important lines of traffic accept these conditions and plunge boldly up and down upon their ways.

From Nob Hill one sees ships in the harbor and the lights of the Mission; from Kearney Street one keeps the view of Twin Peaks, Telegraph Hill rising on the harbor side in a sheer precipice over a hundred feet high. And so the San Franciscan has always the whole picturesque, improbable town with him wherever he goes.

That was the fascinating city as I knew it, almost five decades after the gold rush of '49 had overnight changed a sleepy Spanish town into a reckless, roaring, roystering gambling center of tents and rough shacks.

In the '90's, though a little sobered down, it was still feverish with dance halls and gambling dives and the climate and the outdoor life had flavored San Franciscans with a unique quality of adventurous boy and girlish temperament. It still had the appearance and the manners of an overgrown town of wooden houses and sidewalks. Many one and two-story stores remained even in the business districts. Tobacco and butchers' shops with no front walls, Chinese in colorful costumes. The summertime ferries loading and unloading joyous camping parties. The famous Coggswell statue was still standing, surrounded by red, white and blue lamp posts—till I helped pull it down. Horse-cars were still plodding along "South of the Slot". But the bay had been filled in up to Montgomery Street, covering the hulks of ships abandoned for the gold fields.

Until the wide sand dunes had been built upon, the strong Summer afternoon west winds swept clouds of dust through the city, penetrating every crack in house walls. The Golden Gate Park, one of the finest in the world, stretched its wizardry of gardening from Central Avenue to the Ocean Boulevard.

There were no copper cents, no bank notes, only silver coins were considered worth having, and gold eagles and double eagles such as we shall probably never see again. Generosity, extravagance like the fog was in the air. I don't know whether that jovial, carefree prodigality is gone. (I doubt if I'll ever get teal for two bits again, or a hundred oysters delivered on chipped ice to Russian Hill for fifty cents). But I'm sure

"Horse-cars were still plodding along." Note four beyond cable-car, center, starting up Market Street while, right, another on the turn-table is being headed uptown. Two street sweepers, left foreground, are waiting for something. One of the cobble-stone pavement repair gang, right, seems to be busy. Derby hats, or bowlers, didn't care who wore them. Two men on the old Ferry building roof, right, looking for the usual leaks, perhaps.—Photo from Chas. B. Turrill collection, courtesy Society of California Pioneers.

the Pacific fog still is giving San Francisco gals the most splendid complexion in the world—unless cosmetics are undoing its beauty treatments.

I had been graduated from the Massachusetts Institute of Technology as a civil engineer and was with the Southern Pacific Co. for three years before living in the city, but I have always been interested in architecture and this is the way the physiognomy of the town impressed me. I quote from The Heart Line.

The architecture of San Francisco was, in early days, simple and unpretentious, befitting the modest aspirations of a trading and mining town. Builders accepted their constructive limitations and did their honest best. False fronts, indeed, there were, making one-story houses appear to be two stories high, but redwood made no attempts in those days to masquerade as marble or granite.

During the sixties, a few French architects imported a taste for classic art, and for a time, within demure limits, their exotic taste prevailed. The simple, flat, front wall of houses, now grown to three honest stories high, they embellished with dentil cornice, egg-and-dart moldings and chaste consoles; they added to the second story a little Greek portico with Corinthian columns accurately designed, led up to by a flight of wooden steps; the facade was broken by a single bay-window, ornamented with conventional severity. Block after block of such dwelling houses were built. They had a short of restful regularity, they broke no artistic hearts.

In later days, when San Francisco had begun to take its place in the world, a greater degree of sophistication ensued. Capitals of columns became more fanciful, ornament more grotesquely original, till ambitious turners and wood-carvers gave full play to their morbific imagination. Then was the day of scrolls and finials, bosses, rosettes, brackets, grillework and comic balusters. Conical towers became the rage, wild windows, odd porches and decorations nailed on regardless of design made San Francisco's nightmare architecture the jest of tourists. Lastly, after an interregnum of Queen Anne vagaries, came the Renaissance and the Age of Stone, heralded by concrete imitations and plaster walls of bogus granite.

At the Bohemian Club camp in the virgin forest, once, after a particularly hilarious High Jinks—now soberly called "Grove Play", I stood on a redwood stump and dodged flying champagne bottles (empty) aimed at my head because, in an impassioned harangue I dared defend the cursed name "Frisco". We had, I shouted, the only city in the world, almost, with a nick-

name. And a nickname, I maintained, is the surest sign of popularity. San Franciscans are fools to object to the term. For surely no city in the United States is so well known and so well beloved. No city has so pronounced and so alluring a character. Its name is known wherever men tell tales of travel.

There are a thousand reasons for this individuality. In my Heart Line I cited many of the city's bizarre details. Here are a few.

There are beaches in other places, but there is no other Carville-by-the-Sea. This capricious suburb, founded upon the shifting sands of The Great Highway, as San Francisco's ocean boulevard is named, is a little, freakish hamlet, whose dwellings are built, for the most part, of old street cars. The architecture is of a new order, frivolously inconsequent. According to the owner's fancy, the cars are placed side by side or one atop the other, arranged every way, in fact, except actually standing on end. From single cars, more or less adapted for temporary occupancy, to whimsical residences, in which the car appears only in rudimentary fragments, a suppressed *motif* suggested by rows of windows or by sliding doors. The owners' taste and originality have had wanton range. Balconies jut from roofs, piazzas inclose sides and fronts, cars are welded together, dovetailed, mortised, added as ells at right angles or used terminally as kitchens. (Add to this the things mentioned by Cayley, such as the House of 1000 doors, etc.).

So much for the physical aspect of San Francisco. Of its psychic quality it would be hard to write definitively. One finds in San Francisco whatever one looks for. I was young and ardent, I found Romance. I found Adventure. I found Bohemia.

It is a trite expression, "Yes, but you should have been here when—" Every new generation says it to its successor. The outward form does indeed change. But the heart of youth does not change. It can always find its little Bohemian Paradise for a while in no matter what environment if it can find congenial spirits. Merely to meet any new person is Romance. I have been thrilled at a tea in a Woman's club. I have felt my heart go faster in a subway train to Harlem. And so you may accept this account (quoted in part) from my novel as perhaps a bit too youthfully cynical.

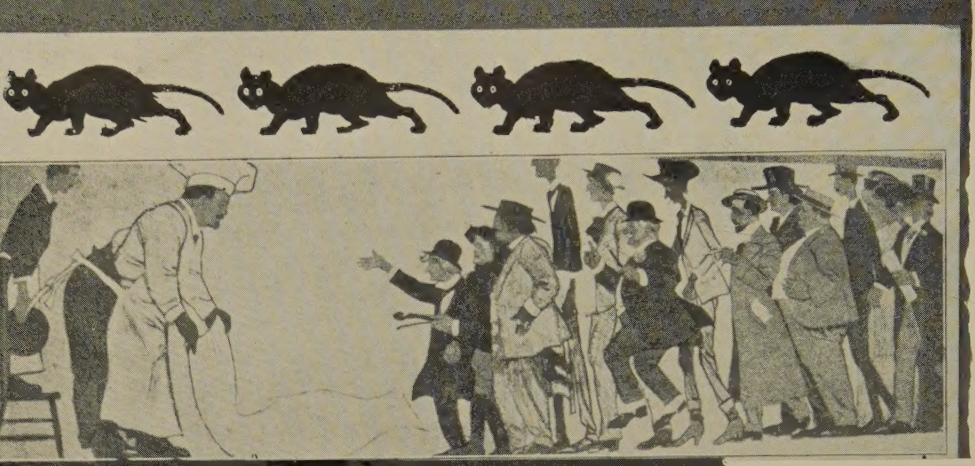
Since Henri Murger's time, the definition of Bohemia has been variously described, until now what is commonly called Bohemia is a place where one is told, "This is Liberty Hall!" —and one is forced to drink beer or cocktails whether one likes it or not, where not to like spaghetti is a crime. Not such was the little coterie of artists, writers and amateurs, who dined together every night at Fulda's (Coppa's*) restaurant.

In San Francisco is recruited a perennial crop of such petty soldiers of fortune. Here art receives scant recompense and as soon as one gets one's head above water and begins to be recognized existence is unendurable in a place where genius has no field for action. The artist, the writer or the musician must fly East to the great marketplace, New York, or to the great forcing-bed, Paris, to bloom or fade in competition with others in his field.

So the little artistic colonies shrink with defections or increase with the accession of hitherto unknown aspirants. Many go and never return. A few come back to breathe again the stimulating air of California, to see with new

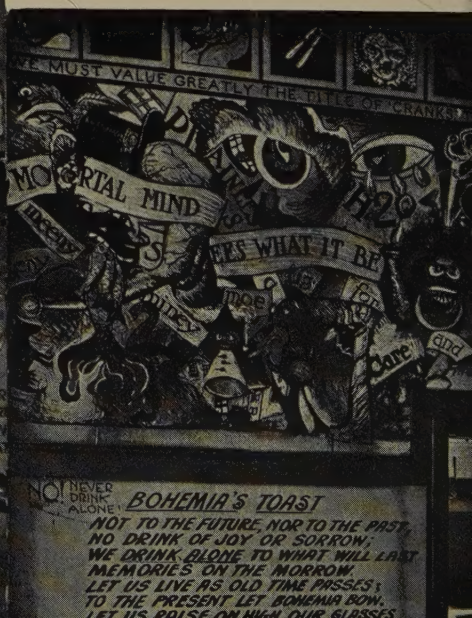
* Joe Coppa's old "red paint" restaurant, long the rendezvous of artists, writers, many of whom became world famous. The great fire wiped it out, scattered to the four winds its coterie of bohemians, and though Coppa endeavored to hold on in several successive locations the spell was broken and another landmark of old San Francisco became a memory.

Old Telegraph Hill, nor'west boundary of the roaring "Barbary Coast," seething sinfully on the flat, left, between this 49er ship lookout station and the busines district of San Francisco.—Photo from Turrill collection, courtesy Society of California Pioneers.



"A fig for care,
and a fig for woe—
Let the World slide,
Let the World go."

Coppa's old "Red Paint" restaurant was for years a rendezvous for bohemia on the frontier between San Francisco business district and Latin Quarter. Top, Joe Coppa welcoming his patrons, a choice portrait group of famous writers, artists, poets, several mentioned by fictitious names in the author's novel The Heart Line (text, opp. page). Next, below, the famous host and his wife taking their ease before the night's work begins. Behind them (also in three views below) upon the walls of this, a bohemian city's greatest bohemian restaurant, were pictures, poems, other spontaneous expressions of exuberant genius limned in colored chalk, paint or crayon.—Photos from the collection of George Mellen, Honolulu, one-time habitue, who designed and modeled in leather the cover of Coppa's guest book wherein stand names of many immortals.


MOURNFUL MIND
NO! NEVER DRINK ALONE!
BOHEMIA'S TOAST
NOT TO THE FUTURE, NOR TO THE PAST,
NO DRINK OF JOY OR SORROW;
WE DRINK ALONE TO WHAT WILL LAST
MEMORIES ON THE MORROW.
LET US LIVE AS OLD TIME PASSES;
TO THE PRESENT LET BOHEMIA BOW.

eyes its fresh, vivid color, its poetry, its romance. To have gone East and to have returned without abject failure is here Art's patent of nobility. Of those who have been content to linger peaceably in the land of the lotus, some are earls without coronets, but one and all share a passionate love of the soil. San Francisco has become a fetish, a cult. Under its blue skies and driving fogs is bred the most ardent loyalty in these United States. San Francisco is most magnificently herself of any American city, and San Franciscans, in consequence, are themselves with an abounding perfervid sincerity. Faults they have, lurid, pungent, staccato, but hypocrisy is not of them. That vice is never necessary. Life is too candid.

The party that gathered nightly at "Fulda's" was as remote from the world as if it had been ensconced on a desert island. It was unconscious, unaffected, sufficient to itself. Men and girls had come and gone since it had formed, but the nucleal circle was always complete. Death and desertions were unacknowledged—else the gloom would have shut down and the red wine of the country would have tasted salt with tears. There had been tragedies and comedies played out in that group, there were names spoken in whispers sometimes, there were silent toasts drunk; but if sentiment was there, it was disguised as folly. Life still thrilled in song. Youth was not yet dead. Art was long and exigent.

It was their custom, after dinner, to adjourn to Champoreau's for *cafe noir,* served in the French style. In this large, bare saloon, with sanded floor, with its bar and billiard table, almost always deserted at this hour save by their company, the genial *patron* smiled at their gaiety, as he prepared the long glasses of coffee. Tonight there were six at the round table.

* * *

Starr pounded with one fist upon the table, his thumb held stiffly upright:

"Dance, Thumbakin, dance!"

he sang, and the chorus was repeated. Then with the heel of his palm and his fingers outstretched, pounding merrily in time:

"Oh, dance ye merrymen, every one,"

then with his fist as before:

"For Thumbakin, he can dance alone!"

and, raising his fists high over his head, coming down with a bang:

"For
Thumbakin he can dance alone!"

They went through the song together, dancing Foreman, Middleman, and Littleman, ending in a pianissimo. Then over and over they sang that queer, ancient tune, till all knew it by heart.

Benton pulled his manuscript from his pocket and read it confidentially to Elsie, who smiled and smiled. Starr recited his last poem while Dougal made humorous comments. Maxim broke out into a French students' *chanson,* so wildly improper that it took two men to suppress him. Mabel giggled hysterically and began a long, dull story which, despite interruptions, ended so brilliantly and unexpectedly that every one wished he had listened.

Then Dougal called out:

"The cavalry charge! Ready! One finger!"

They tapped in unison, not too fast, each with a forefinger upon the table.

"Two fingers!"

The sound increased in volume.

"Three fingers, four fingers, five!"

The crescendo rose.

"Two hands! One foot! BOTH FEET!"

There was a hurricane of galloping fists and soles. Then, in diminuendo:

"One foot! One hand! Four fingers, three, two, one! Halt!"

The clatter grew softer and softer till at last all was still.

My novel, The Heart Line, was a story of three plots. One carried the love interest, one the history of Fancy Gray, crowned Queen of Bohemia and the third had to do with a precious lot of palmists and spiritualistic mediums. I speak of this because San Francisco at that epoch was notorious for the number of public seances being continually held. They were advertised by the score in all the newspapers.

Many of these seances I visited with Mrs. Robert Louis Stevenson, who shared my curiosity. It was not however the revelations from the Other Side that attracted us. It was the human dramas enacted, the tales, the confessions told by devout believers who appealed to us as writers. It was from innumerable visits to these fakirs and the life stories of three different self-confessed charlatans that I derived the information used in my novel. Perhaps nothing was more significant of the life of the city than these popular assemblies. People sought Adventure even beyond the grave.

I have not visited San Francisco since 1913. There are sky scrapers now. The Golden Gate, to my sorrow, is being bridged, and so is the Bay. Almost all of my old friends have left, or gone. But the same fogs sweep in from the Pacific, the same climate is doing its work of emancipation from conventionalities, I suppose, and new generations of Native Sons of the Golden West, I am sure, are carrying forward the banner of Youth.

San Francisco, you must know, has one beloved superstition, one idol still. I share the superstition and cherish the idol. So, with all loyal San Franciscans, I trust and believe, so long as Lotta's Fountain stands in the centre of that magic city, the spirit which has made the place adored and which has sent so many of its citizens on their way to fame and glory will not perish.

Sole living link with our planet's lush and lavish youth these woodland monarchs proved invulnerable through untold ages to every destructive force save one—pygmy man! Now his hand has been stayed by patriotic Save the Redwoods League and for that you will give thanks as you travel California's Redwood Highway. Fossils or dust now these thousands of centuries are the sabre-tooth tiger, enormous elephant, brobdinagian buzzard (illustration p. 146) and all other life contemporary with their heyday for these were old, old trees when "caves where the cave men dwell" were first illumined by " . . a sense of law and beauty".

California's Mountain Thrones

By LAWRENCE H. DAINGERFIELD*
Meteorologist, U. S. Weather Bureau, Los Angeles, California

With illustrations from photographs by the author excepting those credited otherwise.

FLEETINGLY the Mount Wilson solar towers and great telescope housing glistened in their aluminium coats through the *fracto-stratus* clouds of spring. There they stood like phantom mosques and minarets, cleaving the speeding scud which, viewed from our vantage point on loftier San Gabriel Peak, billowed snow white across the range.

We had climbed our grand old mountain to find ourselves in brilliant sunlight only a hundred feet or so above the enshrouding vapor.

In the far reaches beyond Mount Wilson the snow-mountains, Old Baldy (San Antonio Peak), San Gorgonio, San Jacinto, arose like jeweled islands above the sea of billowy, enshrouding, sun-illumined clouds. To the right we caught fleetest glimpses of Mount Lowe summit across which surged the glistening vapor tide. Over the valley land, even to the coast line of the Pacific, spread the vast canopy like a white sea. Beneath the shroud lay the great City of Los Angeles and her many encircling cities from which we had so recently ascended to San Gabriel's quiet, detached, and soul-refreshing throne, a sunlit island in a white cloud-sea.

Beyond the ocean of vapor the Island of Santa Catalina beckoned from the real sea, a sort of messenger from Hawaii 2000 miles beyond yet none the less real to us even as the nearby hidden Cities of the Valley were real.

Standing there on the mountain-island in all that detached quietude, the illusion came to me of other days when I had stood on the summit of Konahuanui above the trade-wind-swept clouds, knowing that beneath the filmy vapor lay Honolulu and just beyond spread the blue and purple sea.

Another day, when the tender jade-green leaves of spring were trembling in the mountain breeze, we climbed the Arroyo Seco trail, cutting the side of the Sierra Madre back of Los Angeles, to Switzer-land. As we skirted the canyon we glimpsed through the windows of the trees the tiny stone chapel nesting on the granite wall across the mighty gorge. It must have been an inspired thought that prompted erection of this lovely mountain throne. If one were to search through all the hidden recesses of this old earth, it would be difficult to find a more delightful and fitting place for Nature's throne than that where stands this peaceful little chapel dedicated to a profound appreciation of Nature and to the very best of human attributes—simple, enduring —like unto the hills in age and grandeur. Here, body and soul may find peace and rest and a refreshment that can come only through communion in the quietude of such a sequestered place. Each Sabbath day the little organ of this tiny temple of the hills sends forth the music of Rock of Ages, Beulah Land, Trees, or some equally appropriate song finding its deep inspiration in Nature and the Creator.

In the late winter or early spring the California deserts blossom forth in all their alluring beauty. Thus we entered the southern end of the San Joaquin Valley by the Ridge Route and looked down upon a vast sea of blue lupines, white primroses, salmon-red poppies, and myriad wild flowers lending their transient beauty and color to the overlying perfumed air. The glorious blending of seemingly impossible shades into a sublime color symphony fills one with reverence for Nature's divine art.

In the Antelope Valley, an arm of the great Mojave Desert a few miles west of Lancaster, we drove beneath a mon-

* The author was in charge of the U. S. Weather Bureau, for Hawaii, at Honolulu from 1918 to 1922.

Great Western Divide, California High Sierra, viewed from Park Ridge near Point of View in General Grant National Park.

ster joshua tree, the yucca palm of the arid Southwest. This lonely giant, a beacon of that high plain, stands aloof from thousands of its kind whose harsh verdure defies the desert's heat and drought.

Perhaps the weirdest "throne" at which we have found sanctuary in all California is that strange, unearthly region known as the Death Valley, a deceptive, cruel, treacherous place in its original, unconquered state, lying below sea level between the Panamint and Grapevine-Funeral mountains. From Dante's View, a mile-high point, we looked into Death Valley depths, painted by the morning sun. Deceptive and smooth the vast basin gleamed and glimmered, a ghost of what was once an inland sea, long since exposing its dry, saline bed in chaotic confusion, well expressed as the Devil's Golf Course.

Beneath us, five thousand feet and more in the Valley, glistened a tiny jewel known as Bad Water, poisonous, nearly 300 feet below sea-level, a liquid remnant of the ancient sea. Beyond the Valley rose the Panamints, with Telescope Peak standing majestically above all. Far beyond, clad in a snow-mantle, Mount Whitney, loftiest peak in the United States (14,496 feet), topped the high Sierra Nevada. In the Valley, where Furnace Creek cuts the rim like a vivid gash, Furnace Creek Inn stands in a tiny, green oasis and, a little way down the Valley, a large oasis marks Furnace Creek Ranch where the temperature rose to 134 degrees in the shade in September, 1913—the highest known record for the Western hemisphere.

Vivid coloration of the canyons cutting the giant walls of Death Valley is extravagant, ranging through red and gold and purple to purest white. Weird shapes and strange echoes inhabit these labyrinthine canyons. Out on the jagged salt-filled floor of the old, dead sea—delightful in winter, pitiless in summer—supreme quiet reigns. Little known to the general public, Death Valley is a Nature Throne destined to be a lure for myriads of people when the fame of its weird beauty spreads abroad.

Nearby Los Angeles a Throne is found amid Vasquez Rocks beyond Saugus, near Mint Canyon, tributary to Solidad Canyon famed for early gold discoveries. Here in fanciful, grotesque shapes, the rock formations are tilted at curious angles, simulating sleeping monsters silhouetted against the eastward desert sky. It was here in this

sandstone chaos that a picturesque bandit* and his companions of another generation are alleged to have established their secret rendezvous whence to swoop down upon luckless wayfarers and their flocks or herds. In the unearthly eerieness of the place one's fancy might easily conjure up the wild spirits of these fearsome freebooters long since gone down the final trail trod by others of their kind. Today a strange quietude haunts this place of jumbled rocks, broken betimes by curious visitors or more rarely by cinema pilgrims from the world of Make Believe.

Northward in late May, with the mountain highways only recently cleared of their mantle of winter snow, we entered the sublime realm of the *Sequoia gigantea,* land of the giant trees. Along the motor trail where the foamy, wild Kaweah swirled and rushed, we had passed a multiude of wild buckeye trees, prodigal in their perfumed canopies of purple plumes. A side trip to Marble Canyon revealed tiny, sun-kissed valleys, made glorious by the dogwood empire, wistfully lovely in their recently opened glossy-white bracts. Here and there on scarred hillsides by some ancient, broken trees, rare, crimson-colored snow plants peeped through the loam in battalions, flowering miracles, where snow had lain but yesterday. Far out on a marble promontory, where our foot trail wandered, we looked into the hazy depths of a mighty canyon. Across the way the wild falls leaped, ribbons of white spray, dashing a thousand feet or more into the depths of Marble Canyon, singing an eternal anthem to rocks and trees, the vagrant breeze, the azure skies and on to its home in purple sea. Across the way the *cumuli* foamed upward from the mountains to the sky.

A little later we wandered amid the giant trees of Sequoia National Park, ponderous, red-brown monsters, so vast that the human eye fails to grasp their stature, so ancient that history is lost in the labyrinth of time since they were seedlings. Greatest of all stood the General Sherman in towering majesty, 274 feet high, 37 feet in its greatest diameter, symbol of life that borders on the eternal. Thousands of these regal trees pierce the sky—arboreal pride of the Sierra. Guarded by the ancient monarch, delightful in their sylvan glory and freshness were the flower-filled, mountain meadows. Across one of these meadows a fallen giant lay where old age ended its pride and grandeur on a day lost in dim shadows of the remote past. Beyond the meadow, where living giants pointed massive spires to the sky, another monarch lay uprooted. Within this tree's great hollow core the pioneer, Hale Tharp, discoverer of the Giant Forest in 1858,

* Tiburcio Vasquez—see book *Los Angeles, City of Dreams,* by Harry Carr; D. Appleton—Century Co., 1935.

Vasquez Rocks near Mint Canyon Road a few miles north of Saugus. Primordial evidence of a riotous geologic spree when the Pacific Coast was readjusted, their romantic lure today is connected with the picturesque bandit Tiburcio Vasquez finally betrayed, shot, wounded, captured at an adobe house near the mouth of Laurel Canyon, May 1874, hanged at San Jose.

once made his home named the "Noble Den" by John Muir, who stayed there with Tharp for several days in 1875, collecting material for his book, Our National Parks.

Where water leaps in wild abandon, changing from crystal to snowy foam, we climbed the precipitous Tokopah Valley, carved by ancient glaciers to form a canyon with far-reaching, rocky walls, talus and moraine in wild confusion; delightful little flowering meadows, finally terminating in its upper reaches in a vast precipice between towering rock-ribbed sides. Here the water leaps in dazzling cascades from a lofty bench, fresh from snow-clad dizzy heights.

Another never-to-be-forgotten 20-mile walk over a part of the high Sierra trail led us along the rugged, unspoiled, high rim of the splendid Kaweah River, starting at Crescent Meadow, fording the white waters of upper Panther and Merten creeks and skirting Seven-mile Hill, glimpsing through myriad conifer windows endless panoramas of sawtooth mountains of the Great Western Divide, with their snow-filled canyons. The sweet odor of young verdure burgeoning in springtime freshness from alpine slopes just freed from snow, and the joyous songs of birds in the brilliant sunlight accompanied by the melody of leaping waterfalls, lent a glorious joy to the wild, free life along the mountain trail. As we descended into Kaweah Valley we glimpsed through lacy needles the glacier-polished surface of vast Sugarbowl Dome silhouetted against a burnished sky. In the rock-lined gorge and the canyon depths foamed the snow waters of the Kaweah cascading to the sea, singing the glorious anthem of untrammeled freedom.

The mountain and canyon vistas from Park Ridge along the east side of General Grant National Park, from Point of View (7730 feet), we found even more sublime than any of Nature's mountain thrones that had gone before. Now the snow-clad high Sierra Nevada and the castellated Great Western Divide, sharply glistening white sentinels, raised their spires to the purple sky. Far down in the canyon sparkled snow-fed, trout-filled lakes; the haunting depths of Kings River Canyon appeared, and in the far western distance, haze-filled San Joaquin Valley faded into a mystery of the unknown.

Down in the realm of the great trees we stopped beneath the towering General Grant, for which the park is named. Its diameter is even somewhat greater than that of the General Sherman, although in general appearance slightly less gigantic. Most perfect of all the arboreal spires we found to be the California Tree, close by the General Grant, its splendid red-brown symmetry thrust mightily to blend with the cobalt sky.

When we first visited these two sanctuaries of the giant sequoias in May, snowfilled trails prevented ascent of the high mountains. In July we returned to Sequoia National Park, rode "shanks

Lone "Joshua" tree in the desert near Lancaster, Antelope Valley, California. These rough and tough members of the cactus tribe seem neither "palm" as sometims called, nor cactus nor tree but grotestque survivors of an ancient age of weird vegetation.

mare" over twenty miles of mountain trails and stood at the summit of Alta Peak, 11,216 feet above the sea. Here the mountain arena spread about us and to the far horizon, a colossal labyrinth of stone and snow and fracturing canyons, dizzy depths and the stupendous heights of Whitney, Muir, Russell, and LeConte, haze-filled gorges with their churning streams—mystical, a dream divine—and like gems set at the mountain's base glistened Pear and Emerald lakes in Circean allurement. Beside the trail appeared dwarfed, misshapen junipers marking timberline, the border beyond which only pigmy life survived. We had passed from the land of giants to the realm of the dwarfs in the world of trees. Higher still we passed the frontier of vegetation into the barren, rocky empire of the high sierra.

A few weeks later, on a motor pilgrimage which carried us to the Columbia River, Mount Rainier (Washington) and Crater Lake (Oregon) National Parks, we drove through the Redwood Empire, a vast realm of the *Sequoia Sempervirens*. Near Dyerville we saw that monarch of known American trees—possibly of all trees on earth —the Founders Tree, 364 feet in height, its regal plume waving in the vivid sunlight high above the heads of its giant subjects. The afternoon sun cast fan-like sheens of light through silent recesses of the woodland canopy, the glorious solitude adding immeasurably to the grandeur of this unspoiled empire bought out of commercial bondage by the Save-the-Redwoods League for posterity and the glory of America.

One of the gems of our wanderings amid the California Mountain Thrones proved to be Lake Tahoe. Fed by the snow streams of encircling mountains, here nestles in an ancient crater a vast, deep, slender body of water. Lynn Rogers has called Tahoe "the liquid jewel of California—the Koh-i-nor of mountain lakes." The surface is 6225 feet above sea level, virtually the same as that of Crater Lake, Oregon, and equally as gloriously iridescent, vividly reflecting the whimsies of sky colors and shadows, shading through green and blue and violet, sentient with lustrous sunlight.

Tahoe at its greatest depth measures 1645 feet, only slightly less than Joaquin Miller's "Sea of Silence," or Crater Lake, which reaches the profound depth of 2000 feet. Pine and fir-clad mountains border Tahoe, forming a frame of splendor, sky-searching, gorgeous sentinels topped by Mount Tallac, throne of the god of rain, approaching in stature Haleakala, (House of the Sun) on Maui Island, in Hawaii.

In the midst of Tahoe's Emerald Bay, a tree-clothed islet rises from the crystal water, fancifully reminding one of Tennyson's Lady of the Lake and also, of the Phantom Ship of Crater Lake.

In northern California we visited

Nowhere else in all the world is there a bloom comparable, for size, beauty and fragrance combined, with this creamy plume thrusting by thousands from as many bristling bases of green bayonets. It is an annual called locally "Spanish Bayonet," "Mescal" and "yucca." Cattle relish the budding stalk, make pin-cushions of their noses to get it.—Nielen photo.

Mt. Lassen Volcano with clouds, not smoke, overhead and, foreground, a great "bomb" hurled from its crater. Below, a close-up of the bomb whose size and weight can be estimated with fair accuracy by comparison with the motorcar alongside. Fancy a projectile of that bulk hurtling through miles of air!

Lassen Volcanic National Park, a mountain throne perhaps more Hawaiian in characteristics than any bit of the Golden State—Hawaiian because *Pele* makes occasional sojourns in this weird and curious realm. Mt. Lassen had been quiescent for about two hundred years when, suddenly, in 1914, a series of relatively small eruptions began, reaching great violence in 1915.

We arrived at Manzanita Lodge, in the northwest sector of the spectral realm of Pele, on a showery afternoon; cloud-racks shut in the vast Peak and we little guessed the wild grandeur of the strange land.

The entrance led us beside the still waters of a lily-pad lake, circumscribed by young conifers casting vivid reflections. Our first reconnaissance beyond Manzanita Lodge carried us through that extremely complicated lava area. known as Chaos Jumbles to the left and Chaos Crags to the right, finally out to that picturesque reminder of past eruptions, the Devastated Area. On the edge of the Wild Zone we drove alongside a "volcanic bomb," of many tons weight, shot from Mount Lassen during some stupendous eruption, a silent reminder of *Pele's* might similar to that manifested at Halemaumau (fire pit of Hawaii's Kilauea) in 1790 with bombardment of the nearby lava plain and destruction of an army of Hawaiian warriors advancing against the forces of Kamehameha the Great.

After photographing the automobile beside the vast bomb (for proper perspective) we turned about and snapped the projectile in the foreground with Mount Lassen in the distance, capped by cumuli casting over the ancient crater an illusion of actual eruption.

The spell of the old mountain was upon me, reaching an irresistible stage in the early hours of the next day when the still surface of Mazanita Lake imaged Chaos Crags, and Mount Lassen rising through to the perfect morning sky in the distance. The call had to be obeyed.

Thus it was that we drove around past Hat Creek Lake, a tiny, azure body of still water trapped by the 1915 lava flow; on past lovely Summit Lake, thence beyond White Mountain with Shadow Lake nestling on its shoulder, to the foot trail on the far side of the intriguing cone. As we climbed the trail to the alpine zone of Mount Lassen (10,453 feet), a constantly widening horizon brought into relief the massive ruggedness of the fantastic terrain formed by the wrath of *Pele*. August, yet snow fields covered protected slopes of the fervent-hearted mountain. At the summit, well above the last lingering remnants of western black hemlock and clusters of white-bark pine, near timberline, we beheld one of earth's most magnificent panoramas.

From the base of great Mount Shasta, plainly visible on a perfect day, the eye sweeps a vast horizon for 200 miles far down the Sacramento Valley to the southwestward, easily placing our vantage point at Lassen's summit in the list of California's most sublime mountain thrones. Even into southern Oregon to the region of Crater Lake and to the east, the shadowy Nevada mountains greeted our vision. In the nearer foreground as we slowly turned about on that high, lonely eminence, we beheld Chaos Crags and, to the east, the White Mountains. To the west, southwest, and south, loomed the encircling giants—Loomis Peak, Eagle Peak, Mount Diller, Brokeoff Mountain and Black Butte, forming the ancient rim of a master crater of which old Brokeoff stands as the far wall and Mount Lassen, on which we stood, persists as the youngest and most active remnant. It is said that if Mill Creek had not broken through and eroded away the south rim that a lake surpassing in grandeur the Crater Lake of today might now fill the vast caldera with Diamond Peak in its midst as another Wizard Island.

Now we stood on the rim of Lassen Crater, Shadow Lake gleaming from the shoulder of White Mountain, Lake Helen at the base of our mountain, a beautiful blue glimmer-glass. In the far southeast, Lake Almanor, vast and lovely, glowed in the early afternoon sun. We explored the frozen crater floor, a fantastic realm of solitude and relics of the eruption of two decades ago. Solfataras, steam cracks, fumaroles contributed their unearthly activities. Patches of snow and catchments of snow-water dotted the crater sides and floor. The whole area proved to be a region of impossible, magmatic confusion, dotted with giant blocks of lava.

Standing in that vast solitude, filled with hidden evidences of *Pele's* power, we dreamed of other days when we stood on other crater rims and explored the caldera depths in Hawaii. Mighty Haleakala, treacherous Hualalai, vast Mauna Loa, snow-capped Mauna Kea, fervent Kilauea, all arose from the far southwestern horizon, passing in mental review—glorious phantasies of the unleashed power of *Pele*.

We might continue the story of California's mountain thrones visited and revered, through many, many pages—Yosemite, the Mother Lode country, Sonora, Angel's Camp (made famous by Mark Twain in his story of the Jumping Frog), the Great Basin, Mt. Tamalpais and Muir Woods near San Francisco, and near Los Angeles the slopes of San Antonio Peak (Old Baldy), San Jacinto, and the Palomar country; Travertine Rock near the edge of the Salton Sea; palm-filled canyons and pine-filled mountain gorges; alpine lakes and dashing cascades in the long clefts of the high sierra—but let those described in meager detail suffice to send greetings of aloha to Pan-Pacific Union members from a *kamaaina** member wandering over the foothills and high places of California.

* Hawaiian for old-timer.

Yosemite Valley was worshipped by the old Indian tribes for centuries ere the Pale Face knew there was a Western Hemisphere. Insensate anyone who, today, feels not that same presence of Diety in this sublime spot. In the distance rises Half Dome a mile above the Valley floor and, left middle distance, the mighty El Capitan.

California: a Drama of People

By JOHN CUDDY

With illustrations from photographs by Californians, Inc., excepting those credited otherwise.

MAXFIELD PARRISH never painted scenes more appealing than countless numbers of those scattered lavishly by Nature throughout California. Gorgeous scenic views beyond man's ability to duplicate are to be found almost anywhere, from the Mexican border to the Oregon state line, from Nevada to the blue waters of the Pacific ocean. Especially inspiring are the high Sierra, granite mountains so fresh in outlines and in coloring as to suggest they were made but yesterday; age-old redwood trees at lesser elevations and along the northern coast, forming vast columned chambers infiltrated by sunbeams which accentuate the silence and the violet shadows; and, indescribable Yosemite Valley with its towering walls and twenty cascading silvery waterfalls.

Not one whit less transcendent in natural beauty are mile-high Lake Tahoe, surrounded by forested mountains, serenely reflecting them and the sky above; mounded hills of the lower San Joaquin Valley and other regions, carpeted with jewel-like wild flowers in springtime; flower-painted desert stretches of the southeast after rain; and white sandy beaches, dreamy with sun and the rhythmic beat of the surf.

When American plainsmen and trappers began to enter this land a century ago, it was a Mexican province. Within its borders they traversed magnificent wildernesses of mountains, forests, and desertlike plains before reaching the thin chain of settlements that extended along the coast from San Diego to a point just north of San Francisco Bay. Twenty-one missions had been established along El Camino Real, the King's Highway, from San Diego to Sonoma, each a day's journey from the next. Towns were growing slowly near some of these and, between, at irregular and staggered intervals, were the *ranchos* of the land-holders, who had received large grants of land either from the Spanish or the Mexican government.

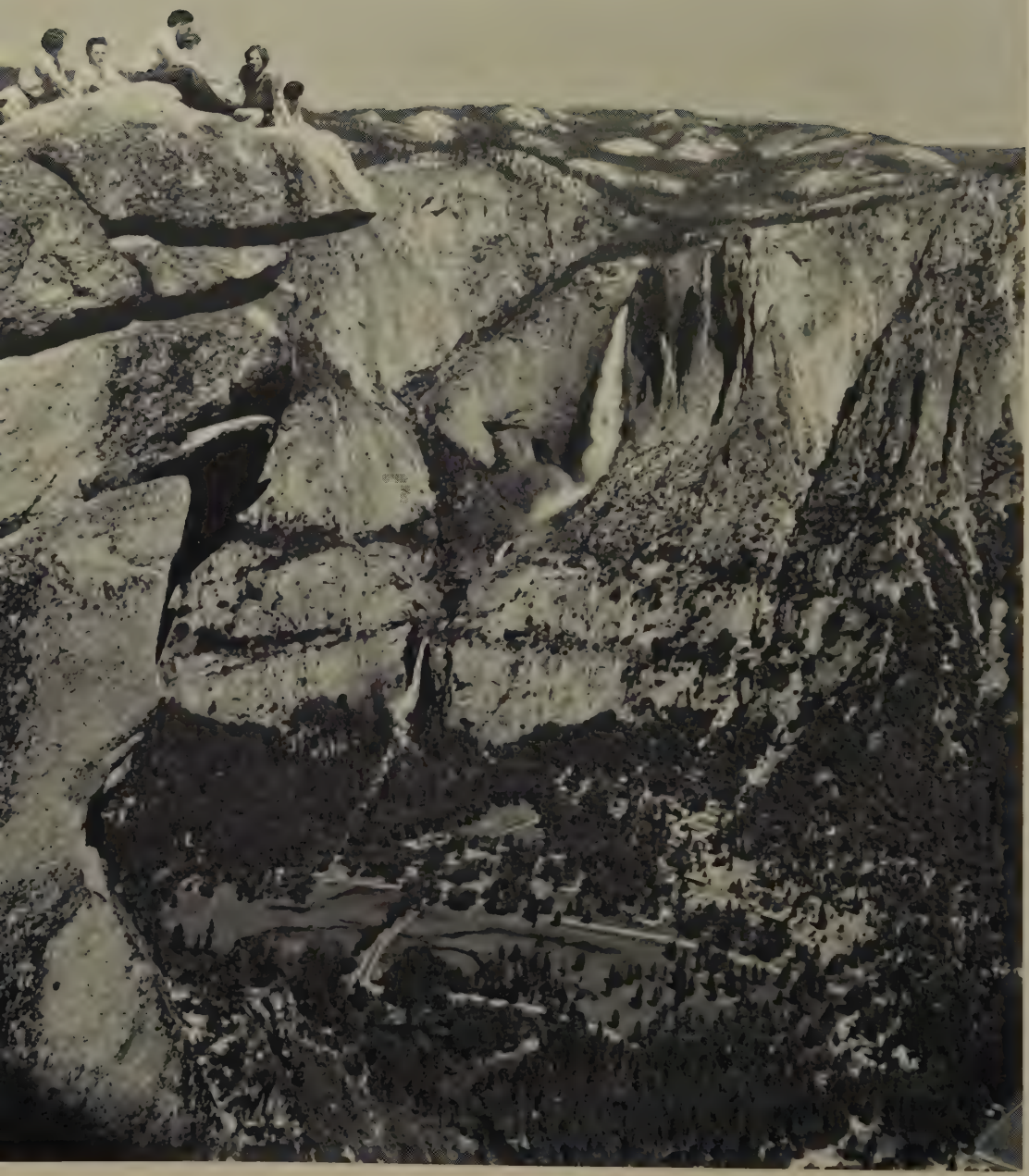
Monterey, the capital, was a town of about one hundred whitewashed adobe houses with red tile roofs, dotted about on lawns, amid flowers and scattered trees. Yankee hide-droghers and whaling ships were touching there and at other places along the coast in pursuit of their business, and gallant white-sailed argosies, out of New England in the China trade, were breaking their long voyages at the same havens, taking on fresh meat and water and, on occasion, engaging in trade with the silks and other Oriental wares they bore.

Santa Barbara was nearly as large as Monterey, but not so sprightly looking, although its imposing mission on an elevation contributed to its dignity. San Diego, also important as a trading point, was smaller still. Los Angeles and San Jose were very small and unpromising, while San Francisco consisted of a few rude structures at Yerba Buena cove, a ruinous presidio about six miles to the west and an all but deserted Mission some five miles southward from the landing place.

Although the Spaniards and the Mexicans had known and claimed California for nearly four hundred years, there were only a few thousand of them resident in the territory. They had been actively colonizing it for three quarters of a century.

The life, however, was idyllic. The large land holdings of the *rancheros* sustained fat herds of cattle and sheep which were counted by the thousands, and hides and tallow were the currency of the land in trading for the linens, silks, jewelry and other things brought in ships from the Atlantic coast and the Orient. The fertile land produced without great toil an abundance of whatever was planted. Wild game was plentiful and easy to procure. It was a land of plenty and the people lived in ease. There was no greed, very little ambition and a great deal of peace.

The usual house of a *ranchero* was a rambling one- or two-story structure of adobe, built around a court or patio,



Looking a mile straight down into Yosemite Valley to the camps at the foot of triple Yosemite Falls. From her attitude, it seems that the rearward young lady of the sightseeing group regards discretion the better part of valor. In the distance roll evergreen highlands of the mighty mountains through which water and time—inconceivable time—cut this stupendous gorge, now a land of enchantment for thousands of visitors every year.

and painted with a lime wash of some color. Nearby were grapevines; orange, fig, olive and other fruit trees; chicken runs, and kitchen gardens. The *Californios* married young and ordinarily children were much in evidence around the house.

The *casa* was open with a welcome that was endless and without price to whoever might fare along El Camino Real. "My house, it is yours!" was the customary salutation. On a table beside his bed the visitor always found a supply of money to which he was to help himself if he had need. He was expected to exchange his tired horse for a fresh one from the herd of the ranchero.

Nearly everyone rode horses and many of the *Californios* were among the best horsemen the world has ever known. They were proud of their fine horseflesh and of their beautifully hand-carved sadles, silver spurs and silver-mounted bridles. The hunt, *rodeo,* bull-and-bear fights, and the dance were common divertisements. Drinking and gambling were not unknown.

Celebrations were held frequently at rancho and at *pueblo,* and one of these might last for days, if not for weeks. People came to them from near and far, some of whom would be on the road for days, stopping en route at houses where their coming would be the occasion for impromptu celebrations. And each time when the journey was resumed, the group of merrymakers would be larger than it was before. Many of the women rode in small groups in ox-drawn *carettas,* the unlubricated wooden wheels of which could be heard a good way off.

Right after this time of one hundred years ago, there developed a notable influx of foreigners into California. Among them were Americans, English, French, and Danes, who came for adventure or trade or because they liked the country. They were hospitably received by the natives and many of them secured land for homes, lumber mills, cattle-raising, or permits for hunting and trapping.

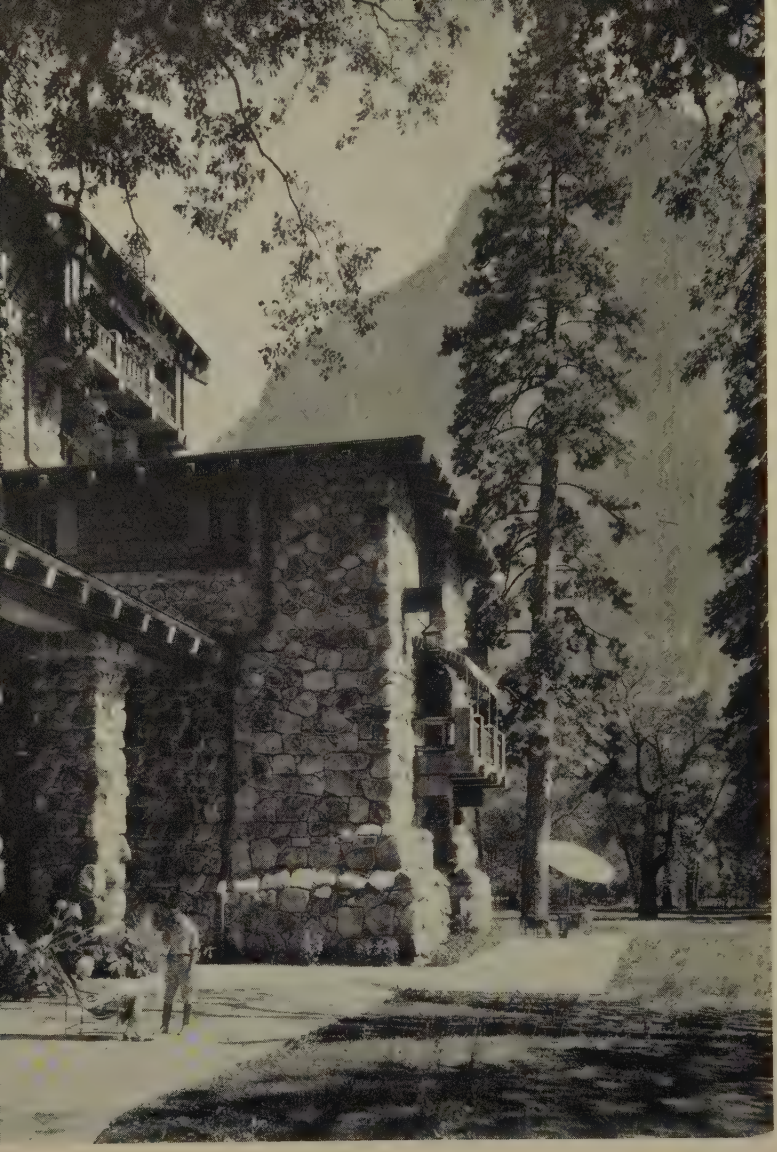
One of these foreigners was Captain John Augustus Sutter, a man of Swiss parentage who had lived in New York and Missouri for a number of years. He arrived by way of Honolulu and Sitka in 1839, with twelve men and two women. Wishing to found a colony in the Sacramento Valley, he applied to the government at Monterey for Mexican citizenship and land. Both requests were granted, and forthwith Sutter set out for his new domain in the valley. He built a trading post and fort at the confluence of the Sacramento and American rivers, which stands to this day as a pioneer museum within the limits of the city of Sacramento, and named his princely region New Helvetia. He employed many Indians to raise wheat and cattle, and in time had a growing trading business throughout the vast expanse of the Sacramento and San Joaquin valleys.

In 1812 the Russians, coming down from Alaska, had established an outpost on the shore just north of Russian River. With ninety-five Russians and eighty Alaska Indians, they built a stout fort and settlement. Their primary objects were to raise foodstuffs for their Alaska colonies and to hunt sea otter along the coast and in San Francisco Bay, and seals at the Farallone Islands.

Their efforts at food raising were not highly successful and in time the fur-bearing animals which they sought became scarce. Under pressure of the governor of California, because they were on land which Spain and then Mexico had claimed for four centuries, the Russians sold their tenuous title to the land and all their equipment to Captain Sutter in 1841 for the sum of thirty thousand dollars.

All of the equipment and supplies, including the household property, the livestock, some forty pieces of cannon and a quantity of old muskets, Sutter transferred to Fort Sutter. The Russian church, the barracks, blockhouses, look-out tower, and other appurtenances of the settlement, built of enduring redwood, are to this day in a state of excellent preservation and have been made a State Historical Monument in perpetuity.

In spite of the influx of foreigners in the late 'thirties and early 'forties of the last century, California's populational growth was slow. While there are no census figures for that period it is reasonable to assume that the most numerous outside element in the territory at



Hotel Ahwahnee harmonizes so perfectly with the wild grandeur of Yosemite Park that it seems a part of the natural picture. Glacier Point forms a backdrop of shimmering opalescence in the haze of incense curling heavenward through tingling mountain air at the call of an ardent sun. Across the way (opposite page) Yosemite Falls "rolls its mighty music to our very souls" and, perhaps, helps the lone fly-caster to concentrate on a fighting rainbow.

that time must have consisted of Americans. Yet General John Charles Fremont, after his first visit in 1845, reported that there were not more than three hundred of them in the entire territory. At that time the great interior valleys of California had been only perfunctorily explored; and the only inland settlement of real importance was Sutter's Fort, with a colony of some three hundred white men, all more or less dependent upon Captain Sutter.

Conclusion of the United States-Mexican War in 1848, and the ceding of California to the Union, aroused new interest among Americans in reports of the climate, fertility and wealth of the Pacific Coast. Pioneers in increasing numbers turned their footsteps toward the lands of the Pacific west. The tide, however, was flowing more strongly toward Oregon than toward California, because there were already several thousand Americans settled in the Willamette Valley, and the Oregon Trail from Salt Lake City was the best known. Then startling news percolated eastward over the trails. There was gold in California for the taking!

James W. Marshall, who had been superintending the erection of a sawmill for Captain Sutter on the south fork of the American River, about forty-five miles east of the fort, saw his work completed on January 23, 1848. That evening he opened the floodgates to clear the millrace of debris. The next morning he closed off the flow of water and then walked down the bed of the race to see that all was in readiness. The water had carried off the light soil and sand, leaving in shallow water pebbles, some of which shone yellow in the sunlight. He picked up several of the

pebbles and found that they were heavy—.

Sutter and Marshall tried to keep the matter a secret, but it leaked out. Word of the find reached San Francisco in April. Most of the five hundred inhabitants of the town thought it was a scheme of Sutter's to populate his domain, where he had dreams of developing a new Switzerland.

Had there not been rumors of gold before, when traders and trappers had told of receiving some of the metal from Indians, and what had come of them?

But gradually more and more of the well-known faces were no longer seen around the bars and the gambling halls. Then one day a wild-eyed man on a foam-flecked horse dashed into the Plaza, waving a flask above his head and crying:

"Gold from the American River!"

Mission Dolores, founded in 1776 on a pleasant plain inland from the Presidio of San Francisco for Christianization of the Indians is now in the heart of a vast city grown around it. For 160 years this June 29 Mission Dolores has been in use continuously as a place of Catholic worship. Mission San Juan Bautista, opposite page, is another bead in the rosary of missions strung by devout Franciscan padres from San Diego to Yerba Buena (San Francisco) in the 17th Century.

Next year the vast stampede known as the Gold Rush was well under way. Men came to California from all quarters of the globe; 30 thousand of them in the twelve months following the discovery. They came in vessels around Cape Horn; they toiled across the Isthmus of Panama; but by far the greater number came overland by ox-train and prairie schooner. San Francisco's population jumped to five thousand during the year; her port became a forest of masts of abandoned ships.

Sacramento, reached by boat from San Francisco, became a bustling supply center for the mines. Strike after

Mission San Gabriel, near Pasadena, southern California, famed in song and story, scene of the annual Mission Play, stands today as it did in the days of the Don. With materials on the ground—adobe (clay) in sun-dried brick for walls, fired for roofing tile, timbers of live oak and rawhide lashings, the padres sounded the keynote of modern California architecture.

strike was made in the hills until the whole region, from north of the Feather River almost down to the portal of Yosemite Valley, seemed impregnated with the yellow metal. Sutter, of course, claimed ownership of all that terrain, but the miners ignored, derided, and abused him. They overran his lands; stole his cattle, horses and sheep; raided his grain and other supplies; tore wood from his mill to make sluice-boxes; in short, they wiped out all his dreams. Years later, in Washington, D. C., while seeking redress from the federal government, he died an impoverished and a broken man.

In 1850, when California was admitted to statehood on September 9, it had a population of more than 92 thousand. San Francisco was an energetic, thriving town of 35 thousand. With the growth of population and the spread of activities in the gold country and, to a lesser extent, throughout the great central valley, a number of the valley towns had developed, notably Stockton, Marysville, and Oroville. 'Fifty-two became the banner year in gold production, when a value of more than 81 million dollars was realized—880 dollars for every man, woman and child in the state. But already a greater source of wealth than the mines was in prospect of development in the cattle

To fiesta and rodeo rode the women in carretas such as this, greaseless wooden wheels on wooden axles screeched news of their slothful progress, yet tallow was the Californio's currency and, then unknown, there lay beneath a vast black pool destined to lend wheels the speed of la paloma and to lubricate them as well.—Nielan photo.

Conjure a crowd of booted placer miners packing grubstakes from the side doors of the old "general store," right foreground; a 2-ox-power carreta where stands the motor; forget the garage where a saloon and dance hall probably stood, and you have a corner in Jackson, mining center of the Mother Lode Country, as it was in the Days of '49.

herds and grain fields of the Central Valley.

People continued to pour into California during the 'fifties and development went on apace. It was an era of excitement, high hopes, hard work, and speculation. San Francisco was the main vortex of the activity. A bustling port, its businesses, banks and industries were growing and increasing in number. Its life was vigorous, colorful, cosmopolitan, inspiring. Plays, concerts, operas and lectures were well attended; enthusiastically received when they were good. Gambling flourished. The prevailing high tension of life bred recklessness and disorder, paved the way to that era of lawlessness that evoked the Vigilantes of 1856. Celebrations were frequent. A piquant journalism recorded the scenes. Building was active—homes, business structures, wharves, churches. The town was spreading out and over its hills. By 1860 it had a population of 57 thousand; the state, 380 thousand.

As the nation approached the crisis between the North and the South, concern was felt in many quarters as to what the attitude of California might be in the event of war. Many of its citizens had come from southern states, and in politics it had always been democratic. The sentiment of its press was preponderantly in favor of the South. There even was discussion of the advisability of establishing California as an independent republic.

In the presidential campaign of 1860, Thomas Starr King, pastor of the First

Oldest three-storey building in California at Mokelumne Hill in the Mother Lode Country. Alongside, left, still stands the little old house where Joaquin Murieta, notorious bandit of the '70's, made his headquarters. Reputedly run down, shot to death, in San Joaquin Valley, another tale records his escape to Mexico where he died peacefully of old age. (Ref. Los Angeles, City of Dreams, by Harry Carr.)

Downieville, in the Mother Lode Country, has been undermined for gold — note detritus right foreground— excepting beneath the court house, right middle distance with cupalo. Downieville's layout is characteristic of the free-for-all "city planning" of helter-skelter gold rush days.

One-man washing for gold was, still is, chiefly by "rocker" or sluice-box into which "pay dirt" is shoveled, sluiced with water to permit gravitation of the heavier yellow metal and fine sand to riffles and thence, as this prospector demonstrates, to the "pan" for further washing and amalgamation with quicksilver.

Unitarian Church in San Francisco, toured the state lecturing in behalf of the Union. He was credited with the election result, which placed California solidly behind Lincoln and the Union.

Desire for news and a more rapid means of communication with the East than then existed, heightened by the national crisis, led to the starting of the Pony Express between St. Joseph, Missouri, and San Francisco in April, 1860, and its continuance until the completion of the telegraph to San Francisco in October, 1861. A result of the war was that Congress passed the Pacific Railroad Bill. The transcontinental railroad was begun in February, 1863, and completed to Sacramento in May, 1869.

With the conclusion of the Civil War the westward migration of people gained new importance. Ex-soldiers, singly and sometimes in groups, took to the overland trail to seek their fortunes in the Far West. Young men from town and country, as well as families, and sturdy emigrants from European countries, swelled the numbers of those moving westward. A majority of these people, with their ox-teams and prairie schooners forming long queues across the land, had California for their destination. When they arrived there they found among their neighbors many other newcomers who had come by sea. When the census of 1870 was taken it disclosed that California's population had swelled to 560 thousand. San Francisco was now a city of 149 thousand.

The Seventies ushered in the dramatic era of California's copious production of wheat and other cereals. As people took up the land, square mile after square mile of the rich deep soil of the Sacramento, San Joaquin, and lesser valleys was plow-turned with multiple shares, each gang drawn by many mules or horses, and the black virgin soil was sown to grain. An impressive sight almost anywhere in the great central valley was the ripening grain, tall and golden in the sun, stretching far as the

San Francisco's sky-line at night viewed across the business district from Nob Hill against a background shot with shafts of light from warships of the U. S. Navy in San Francisco Bay. Beyond lie the cities of Berkeley and Oakland, sometimes called "San Francisco's bedroom," reached by shuttling ferry boats soon to be retired by the great bridge nearing completion.

eye could see, dancing in cadence to the breeze. Stockton became one of the world's important markets and shipping points for wheat. The grain vessels crowded into San Francisco Bay at harvest time, and the beauty of them under sail was then a thrilling sight from Land's End near the Golden Gate, or from many another vantage point along the coast.

This same period saw southern California shaking off the stupor of a century and beginning the development that has since been most astounding. Los Angeles was as yet a sleepy little sunbaked town when the "Indiana Colony," composed of people from the states of Indiana and Illinois, settled at Pasadena in 1874. Other colonies followed, from eastern and midwestern regions, taking up lands for orange groves which later became the sites of thriving, enterprising towns and cities. The settlement of the region was furthered when, in 1876, the Southern Pacific Railroad completed its line from San Francisco to Los Angeles, giving the southern city through the northern one its first rail connection with the East. Four years later oil in commercial quantity was discovered in the Puente Hills, near Los Angeles. The story of southern California's advantages—orange groves, climate, oil, perhaps fortunes to be made in developments and speculations—spread through the East. The boom was on.

In the meantime the Southern Pacific Railroad had been building a second line to the East, via Yuma, southern Arizona and New Mexico, which it joined with the Texas Pacific Railroad at Sierra Blanca, Texas, in 1881. The Atchison, Topeka and Santa Fe Railroad, building westward, entered Los Angeles in 1885.

Chapel of Stanford University, Palo Alto, an inspirational feature of this great institution's unique scheme of architecture, to be found nowhere else on the American continent.

Ensuing rivalry between the two railroads became of paramount importance in sustaining the southern California boom. In their efforts to develop pas-

Campanile of the University of California at Berkeley across the Bay from San Francisco. Located in a grove of native live oaks with, on its campus, the beautiful open air Greek Theater, this great university has one of the largest student bodies in the United States.

senger business for their respective lines, they each conducted a vigorous promotional campaign in the East, in which they extolled the merits of southern California; but perhaps of even more importance than that was an aggressive rate war in which they soon became involved. During at least one period in the 'Eighties, it was possible to buy a railroad ticket from Chicago to Los Angeles for as little as one dollar. Naturally, many people took advantage of the low fares; some to visit friends or relatives already removed to southern California, many others just to see what they might see along the way and in the advertised new paradise, and a few in nearly every coach intent upon finding a new home.

By 1890 Los Angeles had a population of 50 thousand. Other communities around it were growing. Many persons who had come to southern California first as visitors were returning to live. Home and business structures were going up. Citrus, walnut, and other cultivated areas were expanding. Tourist resorts were developing and flourishing. New capital was coming in. And then, in 1892, oil was discovered in Los Angeles itself! The boom grew bigger than ever. By 1900 Los Angeles had a population of 102 thousand.

Meantime the rest of the state had been forging ahead. More and more of the rich lands in the central and northern regions had been tamed. Farming and stock raising were on a grand scale, except in the coast-central valleys where viticulture and fruit growing were crowding out the grains. Wines produced in these smaller valleys were winning the approval of connoisseurs, and prunes from the Santa Clara Valley especially were acclaimed. In addition to gold, other minerals had been discovered. Mining was adding its millions to the income of the state. Lumbering was going forward in the northwestern region. Even the sea was yielding its tribute to the enterprise of man. In the Bay region, industrial activities were expanding; trade and traffic were busy. New people were continuing to arrive, answering the call of opportunity. By 1900 San Francisco had a population of 342 thousand; the Bay region 600 thousand, and the state, one million 485 thousand.

Tucked away in the hills and woods adjacent to San Francisco, residences such as this afford quiet seclusion in close proximity to one of America's most urban communities. Opposite page, a prune orchard in full bloom in Santa Clara Valley just south of San Francisco, poetic annual harbinger of the world's chief supply of breakfast fruit.

San Francisco, the business, financial and industrial capital of the West, had become a fabled city. It had an airy beauty from its position on a hilly peninsula situated between one of the world's great bays and the Pacific Ocean. It was a lively port of romance and adventure. From the Gold Rush days it had been cosmopolitan, tolerant, and a lover of good living. Robert Louis Stevenson, Bret Harte, Mark Twain, and many another of the accounted great had enjoyed its color and its life and had sung its praise. The passing years had added to its interest and its fame. Some people called it the Bagdad of the West.

The men who built San Francisco had come from all over the country and abroad, but largely from long-established Eastern centers. They had the spirit of adventurers, but also the solid principles and training of their backgrounds. No mere speculators these, but builders ,and transplanters of rich cultural traditions. From its early years the city fostered all the arts.

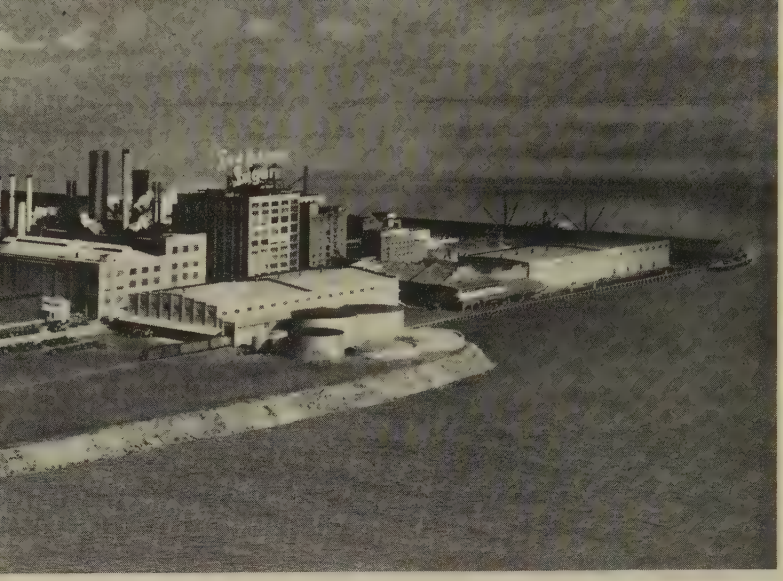
During the 'Sixties, San Francisco derived considerable impetus for its development from the great wealth that poured into its coffers from the gold and silver bonanza of the Comstock Lode, discovered in Nevada in 1859 and developed subsequently largely by San Franciscans. In thirty years the Comstock Mines produced 350 million dollars worth of bullion and paid dividends amounting to 130 million dollars.

On April 18, 1906, occurred the greatest tragedy in San Francisco's history. It was an earthquake, followed by a devastating fire, which raged for three days, laying waste an area of four square miles in the very heart of the city and doing property damage of 300 million dollars.

The dauntless spirit of San Francisco and its rapid recovery from its calamity were impressively demonstrated in 1915, when the Panama Pacific International Exposition in celebration of the opening of the Panama Canal was held in the city. The exposition was a splendid success from every standpoint, in spite of the fact that the World War was then in progress. San Diego, too, celebrated in that year the opening of the canal, with the highly successful Panama-Californian Exposition, which it held in its renowned Balboa Park.

The turn of the century marked the beginning of many changes and a new era of rapid development for California. The single crop ranches were becoming unprofitable; the raising of fruits, nuts and vegetables was spreading; more dairy and poultry farms were being established, and gigantic irrigation and reclamation projects were getting under way. The oil and hydro-electric industries were to be tremendously expanded, and the moving-picture industry was to rise and go on its meteoric, profitable way. The population of the state was to be nearly trebled within thirty years.

One of the first great reclamation and



Western Sugar Refinery's plant at San Francisco, where raw sugar from cane fields in the Pacific tropics is processed to remove excess molasses, turned out chemically pure, sparkling. This old refinery has played a romantic part in the Sugar Drama of the West.

irrigation projects was undertaken in the Imperial Valley in 1900, in the basin of the Salton Sea, below sea level, in the far southern part of the state. It resulted in turning a desert into a garden, eventually consisting of more than 368 thousand acres, producing abundantly of lettuce, cantaloupes, alfalfa, honeyball melons and other vegetables and fruits.

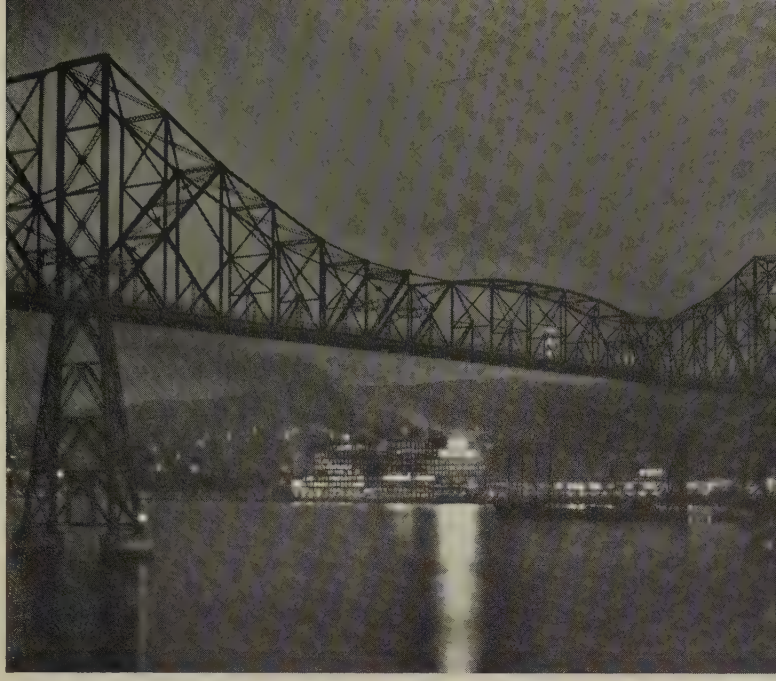
Back in 1895, Los Angeles had adopted a policy of wholesale annexation of adjoining communities and land. It resulted in the city becoming the largest in area in the country, 440 square miles in extent. In 1906, with its population growing rapidly, it saw the need of more water for future requirements, so it went to the Owens Valley, on the eastern side of the Sierra Nevada, and began the construction of a 240-mile aqueduct, forty miles of it to be a tunnel through solid rock, to bring the waters of the Owens River to Los Angeles. It has been using that water for some years.

San Francisco had always enjoyed a splendid water supply, but in 1913 it undertook the building of a great dam in the Hetch Hetchy Valley, in the Sierra Nevada, just north of Yosemite Valley, and of a 156-mile aqueduct, 31 miles of it is to be a tunnel through the Coast Range of mountains, to secure a practically inexhaustible supply of pure mountain water for the city. For some time now, that water has been flowing through the city's mains.

In the first third of the present century, California became one of the greatest oil-producing regions in the world, following largely as a result of the discovery of the Elk Hills field, in the lower San Joaquin Valley, in 1899, and later of other important fields in the same general area. Large refineries were developed in southern California and on San Francisco Bay. Long pipelines were laid to carry the crude oil to them from the fields.

The first motion picture studio for commercial productions was started in a Chinese laundry, which was rented for the purpose in Los Angeles in 1908. The first production, made that year, was a one-reel thriller, Across the Di-

Unsuspected underfoot by Forty-niner as by caballero before him lay a pool of "black gold" destined to render catch-penny by comparison the wealth from spectacular yellow gold and the Spanish ranchero's vast herds. Here we see the great Richmond Oil Refinery near San Francisco, a major note in the strident cacophony of commerce which seems little to have affected the romantic charm of a great city that was Puebla Yerba Buena.



Night view of the great California & Hawaiian cane sugar refinery at Crockett, just north of San Francisco, where much of the raw sugar from Hawaiian plantations is processed to supply a major part of western America's needs. The bridge spans majestically an arm of San Francisco Bay.

vide. Since then, Hollywood has become the motion picture capital of the world, seventy-five per cent of the world's output of such pictures being produced there and in its environs.

The federal census of 1930 disclosed that California's population had increased to five million 677 thousand. Los Angeles had become the nation's fifth city, with a population of one million 238 thousand. San Francisco, with an area of only 42 square miles, had a population of 634 thousand, while in the Bay area there resided one million 580 thousand people. Practically all of this growth had come in eighty-five years.

And California is still growing and developing. Last year it was visited by more than one million tourists from other states and other lands. Studies have shown that one tourist out of every ten returns within a few years of his visit to make his home in California.

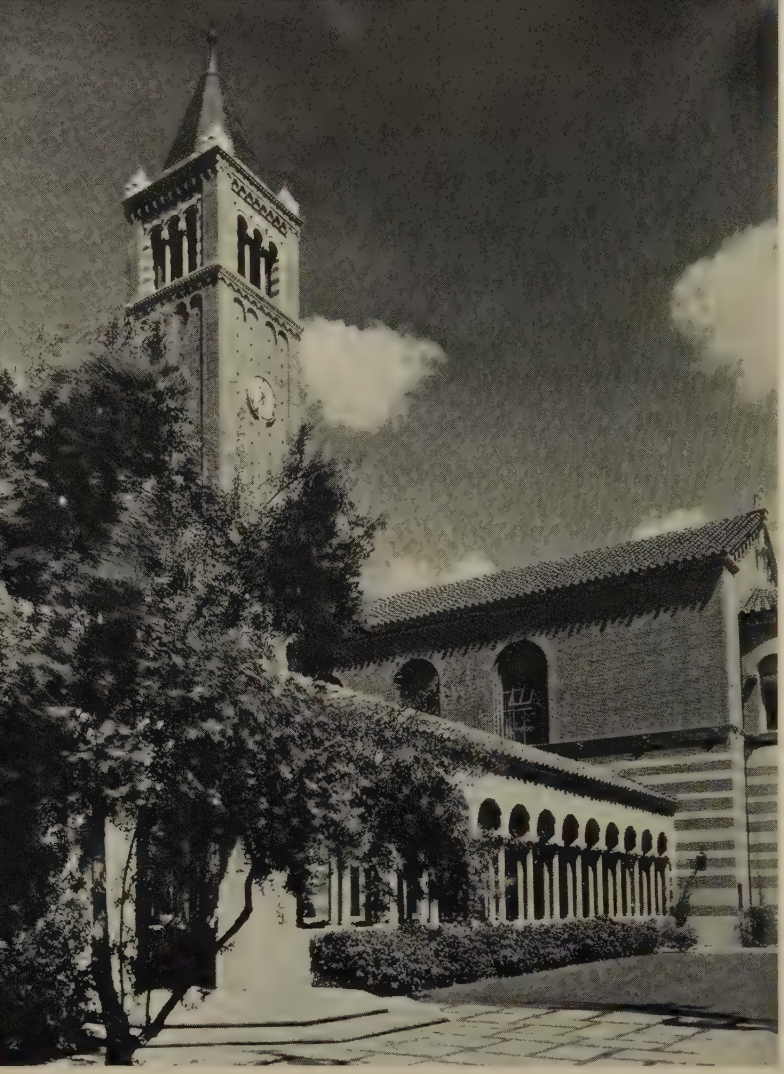
And California is preparing for the future.

In this short article it is not possible to go into many details, but let us at least consider a few highlights.

Boulder Dam, on the Colorado River, has been completed recently, to impound 26-million acre feet of water for irrigation and flood control purposes, and to develop one million horsepower of electrical energy. Think of all the acreage this will bring into production at the proper time in southern California, and of the impetus it will give to industrial development.

The All-American Canal is now being constructed from the Colorado River, to feed canals of the Imperial Valley and adjacent districts. It will

Magnificent forests of northern California lured the lumberman westward on the heels of the gold-seeker. "Timbah-h-h!" echoed through Humboldt forests as "Powdah-h-!" did among the rocks of the Mother Lode Country. This lumber mill at Scotia is backed by the far-sighted reforestation program of modern timber interests.



In the style of the Padres, graceful Mudd Memorial Hall of Philosophy, University of Southern California, exemplifies the civic pride of the southland's great university as it does that of Los Angeles, city of beautiful architecture.

supply ample water to irrigate one million acres of splendid land.

Three years ago, the Metropolitan Water District of southern California began construction of the great Colorado River Aqueduct, to assure a most adequate supply of water to southern California communities for years and years to come.

Central and northern California has in immediate view today work on the great Central Valley Project, one of the very greatest of its kind in contemplation anywhere in the world. This project has for its object the storage and utilization of vast quantities of water flowing toward the west from the mighty Sierra Nevada. Dams will be built in the mountains, and others at various places along both the Sacramento and the San Joaquin rivers, and means be employed for regulation and distribution of the waters as needed for irrigation and other purposes throughout practically the whole length of the great, fertile central valley of the state. The valley is 350 miles long and from 40 to 80 miles wide. Incidentally, great quantities of electrical energy will be developed at various of the dams.

And San Francisco is building the two mightiest bridges in all history, one to the North, across the Golden Gate, the other to reach the east Bay shore. The eastward bridge, riding high above the shipping on the Bay, is more than eight miles long—tunneling through an island in its path. The other bridge, no less spectacular, flings the longest single span in history across the full reach of the Golden Gate—4,200 feet from tower to tower, two hundred and fifty feet above the famed blue waterway. Thus San Francisco breaks its isolation in the expansive spirit of the days that are ahead.

Seed Dispersal in Hawaii

By C. S. JUDD, Territorial Forester

With illustrations from photographs by the author

WANDERING of plants about the world has existed since their first evolution, and is still continuing. Nature never allows an area on which plants can grow to remain bare for any appreciable length of time. The competition of plants for fresh and suitable places of growth is too great to permit delay.

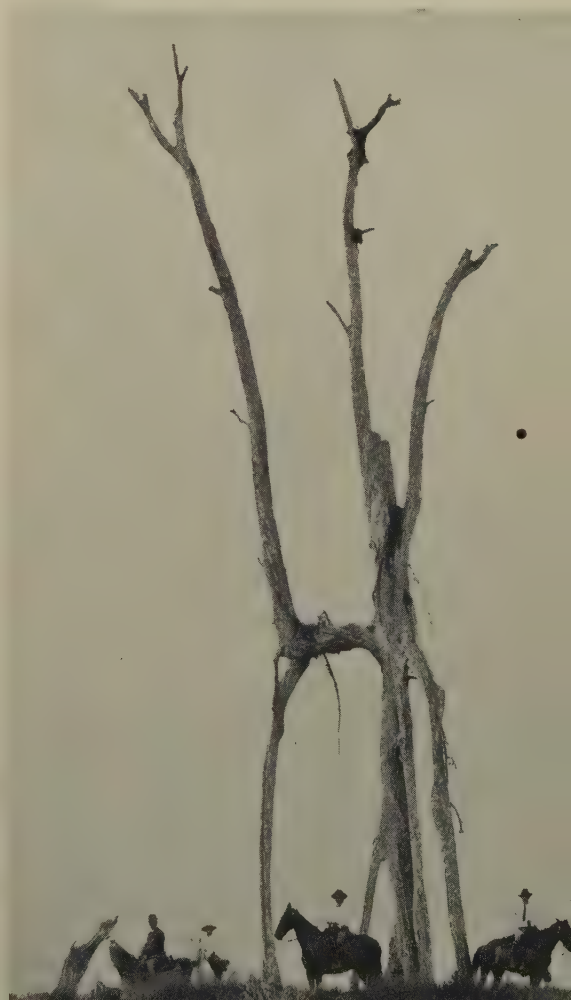
An island rises out of the sea; within a year some plants appear on it, first those that have sea-borne seeds or rhizomes, then wind-borne seeds, then those borne on the feet and plumage of wandering sea fowl, and when the vegetation is tall enough, some land birds bringing seeds of berries and small fruits which they had eaten before their flight. Finally appears man with seeds of his food crops and the weeds which accidentally accompany them or are carried by his domestic animals.

The number of seeds produced by certain plants is enormous. Nature is very lavish in her efforts to perpetuate. Some enterprising scientist with the necessary leisure once undertook to count the number of spores on a fern plant smaller in size than our familiar tree fern and found that it bore at one time 30,996 million spores. Of course, most of the seeds or spores so lavishly produced perish through not reaching a suitable spot for germination and development.

With almost every plant the greater number of its seeds fall too near the mother plant to grow successfully. When plants are too close together disease can spread from one to the other and can become fatal to all. Thus plants are protected by nature by wide dispersal of their seeds. The plants which have the best means of dispersal will be ever the conquering invaders of new ground. Only seeds removed to a distance reproduce the species.

The thinning out of oak groves in France resulted in the dying oaks acquiring new life in spite of the attacks of a fungus. The *lehua* tree (*Metrosideros collina polymorpha*), whose seed can germinate only in full sunlight, has found a successful method of propagating its kind in the dark woods. The seeds fall on tree ferns and other tall trees high above the ground, germinate in pockets of humus and the young plants send their roots down the host to the ground where they develop into sturdy stilt-like trunks, supporting the crown which bathes in the sunlight.

It is of some interest to note that the plant occupation of bare soil follows ap-



Killed by fire, this ohia lehua tree's skeleton illustrates seed germination on a tree-fern host 25 feet above ground. Thus nursed, it drove roots to anchorage and sustenance in the ground.

proximately the same order as was followed by the evolution of plants in the world. The lowest forms, cellular cryptogams, algae, mosses and ferns come first, followed by the more developed and higher forms of vegetation, the phanerogams or flowering plants.

This is borne out locally by observations of the botanist Forbes who found that plant invasion of the new lava flows on the island of Hawaii was first by a few lower cryptogams, followed by ferns and phanerogams on the *pahoehoe* (smooth, hard lava). The wind-borne spores and seeds find a very fertile soil which is apparently formed in the cracks of the pahoehoe sooner than amongst the *a-a* (friable lava) particles.

The general agents responsible for dispersal of seeds are wind, water, birds, animals, man and explosive volcanic eruptions.

1. *Seed dispersal by wind.*

Many seeds are adapted for dispersal by wind by their lightness and by appendages provided by nature for this very purpose. Next to the spores of cryptogams, minute dust seeds, like those of the orchids, are the farthest disseminated of any kinds of plants by the action of wind.

Probably the record for the farthest flight of seed on the wind, according to H. N. Ridley, was that of a Bromeliaceous plant from South America to Tristan d'Acunha, a distance of 5,500 miles.

Tumbleweeds, dust seeds, spores, winged fruits and seeds, plumed fruits and seeds, woolly fruits and seeds, all are borne by wind.

It is no wonder, therefore, that we find the minute, dust-like seed of the Philippine ground orchid (*Spathoglottis plicata*), blown from Punaluu on Oahu over the Koolau range and appearing as flowering plants over a wide area from Pupukea through Waimea to Kawailoa.

The wafer-like seed of the silk oak tree (*Grevillea robusta*), for years has been blown up from the mother tree in Waialua village to the Mokuleia and Kuaokala plateaus where sturdy trees are now growing on the crest of the Waianae Range. Following this clue, the Division of Forestry has planted silk oak trees along the lower boundary of the Honouliuli reserve to act as seed producers so that nature, with the aid of the trade wind, may do cheap but successful and extensive reforestation for us on the upper slopes.

I was very much surprised a few months ago to find in the mountains back of Laie, where a new CCC trail cuts through the dense undisturbed native jungle, at 1,800 feet above the sea, a lone 8-foot tree of the Shrubby Fleabane (*Pluchea odorata*). This is an introduced, composite plant related to the *Kalapini*, which covers our coral fills so extensively in the region between Waikiki and Honolulu harbor. Yet nowhere had I seen this fleabane except at Fort Kamehameha. The light seed that started this lone tree must have been carried a great many miles to find lodgment finally in this distant and remote spot in the wet, native forest.

The composite plant called the *Pamakani* (*Eupatorium odoratum*), supposedly introduced many years ago by Captain Makee as an addition to his charming gardens at Ulupalakua, has not only spread over parts of Maui to the ruination of many hundreds of acres of good pasture land but its light seeds have been blown across Pailolo channel to Molokai where it has become thoroughly established on the moist palis. From the latter island, the light seeds have been carried by the wind across Kaiwi channel to find lodgment in the uplands of Maunalua where about twelve years ago it was discovered with dismay and futile attempts made to eradicate it. Fresh infections have been blown to Oahu and so insidious has

Young milo plants growing from ocean-borne seed cast upon a sandy beach. Milo, a hard wood, was much prized by ancient Hawaiians for making various utensils.

been the invasion that the pamakani may now be found in many places along the Koolau pali, in Makiki valley, on the northeast slopes of the Waianae range in Honouliuli and even over the crest in Nanakuli valley. The CCC boys have lately cleared 30 acres of this plant in the Honouliuli Forest Reserve, replacing the weed with more valuable trees, but they may as well attempt to bale out Aliapaakai with teaspons. Millions of young plants spring up from the ground and, even if these could all be destroyed, fresh, wind-borne seeds arrive almost daily from Molokai.

I would not be at all surprised to hear soon of the appearance of pamakani on Kauai in fairly well established patches.

2. *Seed dispersal by water.*

The earliest plants were probably aquatic and necessarily water-dispersed. Seeds, spores, bulbs, rhizomes and other fragments of the vegetative parts of plants can be carried by rain wash, rivers and floods all over the continents and by sea currents from one continent to another and from one island to another. Almost the only requirements of a seed or fruit for water dispersal are sufficient buoyancy and a sufficiently long period of impermeability by water to allow of its being drifted as far and no farther than is necessary.

Millions of seeds are carried down rivers all over the world, often drifting away to the open sea, where they form masses of seadrift, mixed with logs and branches of trees. Except in the case of seeds or fruits modified for dispersal by sea, all perish before they can reach a suitable habitat where they can establish themselves. It is not by individual seeds that this form of seed dispersal is successful, but there is considerable evidence that seeds and fruits may be borne long distances on floating logs and other vegetable remains and in the crevices of floating pumice and thus successfully be introduced to foreign lands.

Ridley points out that in addition to seeds: "It is undoubtedly the fact that it must have been on such rafts as these that the endemic rats, shrews, lizards and land mollusca have arrived at the most remote islands."

"A considerable number of land snails arrived in Krakatoa very speedily, quite upsetting the old theory that the presence of land snails implied a former land connection." Professor Thomas A. Jaggar, volcanologist, states that he has seen, in the region of the Phoenix Islands, masses of floating vegetation large enough to support a tiger.

We are all familiar with the numerous logs cast by the ocean on the windward shores of our islands after their long journey on the Japan Current from Washington and Oregon. In 1923 I found a whole Oregon ash tree which had made a similar journey to find lodgment in a cave on Nihoa.

A large number of seeds are known to have been conveyed by the Gulf Stream from the West Indies to Europe, a journey estimated to be at least one year's duration. Many of these seeds appear to have arrived in Norway and on the English and Irish coasts in good condition for growing and some from the Azores actually germinated and grew after a voyage of nearly 3,000 miles.

Some seeds like the *kamani* (*Terminalia catappa*) and *hala* (*Pandanus tectorius*) are either corky or have air spaces within them which make them buoyant. A *milo* (*Thespesia populnea*) fruit has been known to float a year in

Young mangrove plants growing on tide flats of Molokai island with, inset right, the infant plant which germinates on the tree, falls, floats on the water to a favorable location.

Easily distinguished by their light green foliage, kukui trees wind their silvery queues down gulch and canyon throughout Hawaii. Their spherical, hard-shell nuts, well waterproofed with oil, are dispersed thus by freshets.

ocean water and then have its seeds germinate. These are now washed by ocean currents along our coasts and germinate in favorable places on the beaches. The seeds of the *kakalaioa* (*Caesalpinia bonducella*) or Hawaiian marble were proved by Guppy to keep for 2½ years floating in water and never to show any signs of germinating, but when filed and planted they germinated healthily. The buoyancy of this hard, flinty seed is due to a large cavity between the cotyledons.

The mangrove (*Bruguiera sexangula*) springing up on our ocean mudflats at Kalihi, Heeia, Kahaluu and at other parts of Oahu's shores came as small voyaging plants on ocean currents a distance of at least 60 miles from the imported trees originally planted on the lee shores of Molokai. The same course was followed when the South Sea trading schooner *Carrier Dove* went ashore on the west end of Molokai and two tons of copra from the wreck were gathered up four days later on the Kailua beach on Oahu.

Many, no doubt, have seen the queues of light foliaged *kukui* (*Aleurites moluccana*) trees winding their way down a hillside gully and the thickets of *haole koa* (*Leucaena glauca*) on the lowlands. The distribution of the trees in such situations is due entirely to the action of freshet water in washing from the uplands the nuts down the gullies and the seed on to the fertile plains.

3. *Seed dispersal by birds.*

Birds play a lively part in the dispersal of seeds and this is brought about in three ways. Fruits and seeds may adhere to feathers and to mud sticking to the feet of birds, the birds may either eat the seeds which later sprout from the droppings, or the birds may carry the fruits to a convenient roost, eat off the surrounding pulp, and discard the seeds which fall to the ground and germinate. As an illustration of the latter method of seed dispersal it is a surprising sight to see at the Bird Park near Kilauea on Hawaii young *kopiko* (*Straussia spp.*) trees coming up abundantly under the *ohia* (*Metrosideros collina polymorpha*) trees. In many cases birds clean from seeds the surrounding pulp which, if allowed to remain, would become hard and dry and prevent germination. Nurserymen do the same.

If you have visited New England you are familiar with the rows of red cedar (*Juniperus virginiana*) trees which line the fences, the seeds having been dropped by birds perching on the rails. The same thing occurs here in Hawaii with Java plum (*Eugenia jambolana*) trees; the mynah birds perch on fences while eating the purple fruit and discard the unpalatable seed. The plover no doubt brought our local huckleberry, the *ohelo* (*Paccinium reticulatum*) from Alaska and the advent of the Chilean strawberry (*Fragaria chilensis*), which grows at the higher elevations in these

islands must be ascribed to birds of long flight.

The sedge (*Scirpus lacustris*) which grows in marshy places and is widespread over the world, in Europe, Northern Asia, America, Australia and New Zealand, Norfolk Island and Easter Island, which is here called the *Akaakai,* must have been introduced by birds carrying the achenes on their feet.

We are indebted to birds for the spread locally of the Java plum, the royal palm (*Oreodoxa regia*), prickly pear, fire tree (*Myrica nagi*), the Christmas berry (*Schinus terebinthifolius*), and on the cliffs the native ebony or *Lama* (*Maba sandwicensis*). Some of this dispersal is desirable, some not, especially according to the ideas of stockmen. The *melastoma* and *rhodomyrtus,* innocently introduced not very long ago because of their attractive blossoms, have been spread by birds in the region of Kilohana Crater on Kauai and have become a terrible pest by covering up good grazing lands. The Himalayan blackberry has been carried by birds from Makaha valley up 4,000 feet to the summit of Kaala much to the discomfort of hikers in shorts who have to traverse the knife-like ridge crest.

Dr. Hillebrand's name has no doubt been vilified innumerable times by stockmen whose pastures were ruined by the lantana plant (*Lantana Camara*) before the eight parasites introduced from Mexico in 1902 became an effective control. In his defense, I am glad to agree with Swezey that there is no doubt that, had other conditions remained as they were in 1858, when the lantana was introduced by this noted botanist, the plant would never have increased and spread to the extent that was subsequently reached.

The native birds would not feed on the lantana berries to any extent because of a different environment. Primarily, increase of lantana followed introduction of the Chinese turtle dove, which found in the aromatic berries a favorite food. Still later, another Oriental bird, the well-known Indian mynah, was imported and being a voracious feeder on the berries, aided the doves in spreading the seeds far and wide. Both these birds found a most favorable environment in the islands and, increasing their own food supply, they spread lantana much to the detriment of pasture lands, and soon became extraordinarily numerous.

In bird introductions, therefore, it is well to study carefully beforehand and attempt to avoid any avian combination with our flora which might result in a very undesirable dispersal of seeds.

4. *Seed dispersal by animals.*

Seeds are dispersed by animals in two general ways. Some seeds and fruits are provided by nature with hooks and spines which attach them to the fur or hair of animals, or unarmed seeds and fruits may adhere to the feet of animals in mud. Again, animals may eat the fruit which, passing unharmed through the alimentary canal, germinates in their droppings.

Introduced in 1828 by Father Bachelot, the *algaroba* (*Prosopis juliflora*), known on the mainland as *mesquite,* has been spread mostly by cattle over 100,000 acres of what was formerly dry, barren, unforested waste land. These useful groves now supply fodder for animals, pasturage for bees which produce a superior brand of honey from its blossoms, and durable wood most suitable for fence posts and the making of charcoal. What better monument could have been erected in memory of this exiled Catholic priest?

Guppy claims that on the Puna coast of Hawaii the wild goat is an effective agent in the dispersal through droppings of *naio* (*Myoporum sandwicense*), *noni* (*Morinda citrifolia*), *ahuhu* (*Tephrosia piscatoria*), and *hialoa* (*Waltheria americana*) seeds over the almost bare surfaces of pahoehoe lava flows. Sheep have dispersed European plants to many parts of the world, to Argentine, South Africa and Australasia by virtue of carrying seeds in their wool.

The dump heap of a certain woolen mill on the mainland of the U. S. is a favorite collecting ground of an amateur botanist. This mill imports raw wool from South America. In the process of cleaning the wool, much dirt and many seeds are thrown on the dump heap and the search of the botanist is rewarded by many new and strange plants. I won-

der if the plant inspectors or other state officials have ever thought with anxiety of this surreptitious method of the introduction of seeds of undesirable plants with possible pernicious insects harbored within them.

I have a little white dog with long hair and a sweeping tail who is a good traveler and goes out on routine hikes with me. He not only always gets so muddy on rainy days that he has to be washed before he is allowed to re-enter the house, but he also brings back in his hair a variety of seeds—the Spanish bayonet (*Bidens pilosa*), and clover (*Desmodium uncinatum*), sand burs (*Cenchrus echinatus*), *kikanias* (*Xanthium canadense*), stick grass (*Chaetochloa verticillata*), and *pilipili ula* (*Chrysopogon aciculatus*), some of which have to be cut out with scissors.

The extensive *waiawi* guava (*Psidium guayava pyriferum*) forests of the Niu valleys on Oahu have been established by hogs eating the fruit. The thorny *klu* bush (*Acacia farnesiana*), with its aromatic, yellow blossoms has been spread along the dry shores and foothills by cattle that are fond of the foliage and sticky seed pods.

5. *Seed dispersal by man.*

The dispersal of seed by man is of considerable importance and is characterized by quality rather than quantity. This method does not apply so much to Cryptogams, which are dispersed by man to a much smaller extent, as to flowering plants. Changes made by man by plant introductions and land clearing and cultivation may result in the extermination of plants previously occupying the soil and the complete alteration of the environment.

Seeds are dispersed by man in cereals and in vegetable seed, in bird food, carts, ballast in ships, packing materials, fodder, road material, dry and dye plants, and in enough other and innumerable ways to turn the hair of a plant inspector gray or give him a series of bad nightmares. The Hilo grass (*Paspalum conjugatum*) has been spread through parts of our mountains by the carrying of seeds on wet trousers.

Seed of the panicum grass (*Panicum molle*), now widespread on Oahu, arrived here by being sent in a letter envelope by Dr. Kotinsky from Suva to David Haughs, former forest nurseryman.

The Maoris in their early canoe voyages brought to New Zealand their favorite clothing plant but found that the *wauke* (*Broussonetia papyrifera*) would not grow in most parts of the colder two islands and so turned to the native flax (*Phormium tenax*) for a substitute. They likewise found that the breadfruit (*Artocarpus incisa*) would not grow, even in the north island, and so turned to sweet potatoes (*Ipomoea spp.*).

Among the 23 plants brought by the early Polynesian settlers and successfully introduced to Hawaii, according to Hillebrand, were such seedless plants as the breadfruit, banana (*Musa*), and *ti* (*Cordyline terminalis*). This was a feat not only of successful navigation but of surprisingly skillful horticulture.

These human introductions were followed by seeds and plants brought to these islands by early navigators and particularly by Don Francisco de Paula Marin, an early horticulturist who arrived in Hawaii in 1791 and died in 1837. Don Francisco will long be remembered for his services in introducing useful fruit trees and other plants and in setting an example of industry. His introductions were followed by the activities of Hillebrand, Jaeger, the local government, and by the Experiment station of the Hawaiian Sugar Planters' Association, all of whom have been responsible for contributing greatly to the wealth of our island flora.

Most modern method of seed dispersal by man is from airplanes and while it has been successful in one or two cases in Hawaii it cannot be counted on as an economical method because of the high cost of operation and the utter waste of vast quantities of expensive seed which unavoidably finds a hostile germinating bed.

So much for general methods of seed dispersal by wind, water, birds, animals and by man.

In adding the agency of explosive volcanic eruptions, Prof. Jaggar points out that the spores of certain algae, which grow only in hot water, in the thermal springs of volcanic regions, could have been spread over the globe

from the Yellowstone to Japan, from Iceland to Hawaii only by this method.

Still another method of plant dissemination might be termed the gravity system of plant and seed dispersal. This is one in which the force of gravity alone is brought into play. A portion of the Koaie valley, a branch of Waimea Canyon on Kauai, is being so choked by the century plant (*Agave americana*), that one can ride through it only with great difficulty. The young bulbils, sprouting on the tall flowering stalks, have fallen to the ground by the thousands and taken root, forming an almost impenetrable jungle of spiked leaves.

The so-called red-flowered Samoan ginger (*Alpinia purpurata*) germinates its seed in the axils of the flower scales. These young plants grow crowded together on elevated stalks and as they grow they take on weight so that the force of gravity gradually bends the stalk over to the ground where the young plants find a lodging in mother earth.

The seed of the *koa* (*Acacia koa*), which has a remarkable viability, falls almost directly to the ground without extensive dispersal from the mother tree. There it is gradually covered by rotted leaves and awaits a time, which may be 25 years distant, when it is released for germination. Fire passing over the ground where old *koa* trees have grown results in a natural reproduction of this useful tree. Immediately after the fire of August, 1934, at Pupukea on Oahu there came up on most of the burned area a young stand of koa trees. Counted three months after the fire, the average occurrence of the seedlings was at the rate of 3.3 per square foot or 143,573 per acre, quite sufficiently abundant to restock the area.

Of a total of 122 introduced and native trees which reproduce freely in Hawaii, 62 or about one half of them have their progeny near the parent tree. This is due to the fact that the seeds are either too heavy to be wind borne, do not have appendages which would attach them to animals or make them capable of traveling on the wind, or are unpalatable to stock. In this case gravity is the only element involved in their dispersal.

Of the remaining 60 trees, the chief agencies or methods of their distribution are apportioned, per cent, as follows: birds, 44; wind, 28; animals, 8; root sprouts, 8; ocean currents, 7; streams, 5.

A final adaptation of the gravity system by which plants are spread to distance may be called the stepladder method of seed dispersal in which the time element is important. Immigrant plants may work their way from the shore and travel inland. By the process of evolution new species are developed in the course of time. An excellent illustration of this is the native plant called *Naupaka,* which is a genus of 83 species distributed over Australia, but mainly West Australia, and over New Caledonia and India.

Scaevola frutescens, the *Naupaka* which is also called the "Beach Magnolia", is of wide distribution throughout the islands of Polynesia. It hugs the shore, has white, waxy fruit and a thick leathery leaf which resists the bitter at-

Natural reproduction of the Hawaiian koa, center foreground, on the Pupukea burn, Oahu. Fire passing over old koa forest hastens germination of seeds that have lain dormant for, perhaps, 25 years.

tacks of the salt spray of the ocean. It no doubt came in seed form to these islands in long ages past from Australia as, what Perkins is pleased to term, a "chance immigrant" in ocean drift.

There are six endemic species of this genus which have developed here from this original plant by evolution, by an urge to travel inland and upward, one of them having even reached our highest mountain tops. Descendants of the original bush have crept inland by the stepladder method and in finding new environments have so changed their characteristics that taxonomists have classed them as different species.

Three of these do indeed differ in the following respects: The original beach form, still abundant on our shores, has white blossoms and fruit and thick leathery leaves. The form next inland, but on the lowlands, has white blossoms but a black fruit and thinner, more delicate leaves. The form on the uplands further inland has gorgeous purple blossoms, a purple, fuzzy fruit and velvety leaves, and the fourth form which has reached the highest mountain peaks and is constantly bathed in mountain fogs has black fruits, thick leaves and a beautiful, long, yellow, waxy blossom. All have the same characteristic of appearing to be only half a flower but each has these distinctive and specific differences.

It has taken time for these plants to creep inland, the seeds from the beach form dropping a little farther away from the shore, the plants from these seeds growing and in turn dropping seeds still farther inland, and so on, by this slow, stepladder progression during aeons of time with changes of the plants into different species until mountain tops 3,000 feet high and 6 to 10 miles distant from the coast have been reached. All this enterprising progression took time but there was much time in Hawaii in those days. Perkins says:

> I think that those who are in favor of the comparatively frequent accession of immigrants to account for the great series of allied species, or groups of allied species, hardly make full allowance for the great age of the islands. Hitchcock remarks in writing of the most recent portion of the group, the still active Mauna Loa on Hawaii: "When one considers how little the bulk of the mountain is made up of the few flows delineated on the map, and how small a portion of the whole mass these can be, he is overwhelmed by the certainty that there were millions of streams and that millions of years must be assumed in order to say how old the mountain is. It must have commenced to build up long before the tertiary period".

"And here," Perkins adds, "he is considering the most recent portion of the group and not the vastly more ancient parts."

The evolution of species as demonstrated by the *Naupaka* plant, from the original immigrant of which six new endemic species have evolved, as merely outlined above, may be compared with the plants of the Lobelia family. Again Perkins says: "The multiplicity of the lobelias and their isolation from foreign forms bears a striking resemblance to that of the Drepanid birds themselves, indicating likewise an extremely ancient occupation of the islands."

The Drepanids are the perching birds of the Hawaiian forests and include the majority of the song birds, numbering 40, peculiar to the islands. Among these are the *iiwi, apapane, amakihi* and *mamo*.

The birds' bills lengthened with the increasing length of the tubular flower of the lobelias. This adaptation of the bill has led to some most remarkable changes. From the firm, straight bill of the *Oreomystis*—the genus supposed to conform closely with the ancestral form which may have come from America in very remote time, and the form from which all other genera of the family are supposed to have evolved—we have widely different types of bills developed. In one branch the normal straight bill becomes long, slender and singularly curved, with a tubular tongue, especially adapted to securing the nectar from long tubular flowers. The opposite branch leads off by gradual degree to where a short, thick bill of astonishing strength enables the bird to confine its food habits to cracking the flint-like seeds of the *naio*. Between the two are all manner of special forms and an unusual diversity of structure which must have required a vast time for their evolution.

As we look back over these various natural methods of the distribution of seeds, it may be concluded that the agency of water is of the greatest importance in their dispersal to new lands.

Plant Collecting on Lanai, 1935

By F. RAYMOND FOSBERG, B.A., M.S.

THE island of Lanai, when viewed from the sea or from neighboring islands, presents a dry, barren, and most uninteresting aspect. It is little known, compared with the other islands of the Hawaiian group, and general belief about conditions on Lanai tends to agree with and confirm the impression gained from a distant viewpoint. The widespread opinion about this island is that there is no rain, that the forests have been well nigh destroyed, and that there is nothing there to see but a huge pineapple field.

In botanical literature with the exception of many descriptions of plants peculiar to Lanai, the island has been neglected. Hillebrand, in his Flora of the Hawaiian Islands, scarcely mentions Lanai, while he discusses the other islands to a considerable extent. Rock, likewise, in his fine book, The Indigenous Trees of the Hawaiian Islands, dismisses Lanai with a single paragraph. Writers in other branches of natural history have remarked about the almost complete denudation of the forests on this island, saying that there are only a few acres of forest left on the top of the highest mountain.

When, last November, through the courtesy of the Hawaiian Pineapple Company and the kindness and hospitality of Mr. George C. Munro, of Honolulu, and Mr. and Mrs. James Munro of Koele, Lanai, I was enabled to collect plants on Lanai for a week, I went expecting to pick up the last remnants of a dying flora. I was certainly in no way prepared for the wonderful condition in which I found the forests of the island. Lanai furnishes a striking example of what vigorous efforts at conservation may accomplish, also of what the native Hawaiian forests will do for themselves when protected and given a chance. How this change has come about is a story well worth telling.

It is the story of the efforts, over a period of more than twenty-three years, of a man with a rare combination of keen interest in and love for plants, strong business ability and the vision to see far enough ahead to realize the potential value of the miserable remnants of forest which remained when he took over the management of Lanai Ranch. The fact that there is today a fine forest, and consequently a dependable water supply, on Lanai is the direct outcome of the work of Mr. George C. Munro, until he retired as manager of Lanai Ranch. Mr. R. L. Usinger, entomologist of the Bishop Museum, and I were fortunate enough to be conducted over the island by Mr. Munro, who told us of his conservation work, pointing out the differences between conditions which exist now and those which prevailed twenty-five years ago.

At that time the forests were being rapidly devoured by thousands of head of wild cattle, goats, deer, sheep, and pigs. Soon after he arrived, Mr. Munro declared war on these animals. Many of the wild cattle he ordered driven into

Pua tree survivors, unprotected by windbreaks, of the once extensive Pua dry forest that covered this area. Note erosion, foreground, somewhat stayed by tufts of grass. Dark line, left distance, is a planted windbreak. In right distance rises Mount Lanihale.—Bishop Museum photo.

Gardenia Brigami, right foreground, near Kanepuu, one of the few survivors of this species well nigh extinct in Hawaii and found nowhere else on earth. Its blossoms are exquisitely fragrant.—Fosberg photo.

large corrals, to be domesticated and used as breeding stock for the ranch, as the ranch was understocked at the time. The other animals he hunted down relentlessly, killing them by thousands. Today they are almost, if not completely, eliminated. There is probably not a pig or cow or goat left wild on the island, and the deer and sheep, if any remain, are so few as to be negligible. The mountains were then fenced off and even the ranch cattle kept out. From that time on, the native forest on Lanai began to come back. Many plants were introduced from other places to help in this reclothing the mountains with forest but, though some of them have flourished, the important elements of the new forests are the native trees and shrubs which have always grown there. One introduction, molasses grass (*Melinis minutiflora*), is apparently of great value in protecting the bare land at the lower edge of the forest from erosion while the forest gradually spreads.

The water supply was not the only problem on Lanai requiring conservation methods. The whole north end of the island, being denuded of the dry land forest with which it was naturally covered, was starting to blow away. Strong winds cut rapidly into the exposed soil and great dust storms resulted. Ordinary wind-breaks of *Eucalyptus* and other trees were of no use, as they were immediately killed by a terrific bombardment of wind-driven sand and gravel. Realizing that if the dry land forest, of which a few small patches remained, could be encouraged to come back this part of the island might be saved, Mr. Munro studied the matter for a few years and then invented a new sort of wind-break.

A great many sisal plants were growing near Koele where they were not wanted. Mr. Munro had them dug up and hauled out to the region where the wind-breaks were necessary. Here furrows were plowed and the great rosettes of thick, leathery leaves of the sisal were planted in long rows where the wind-beaks were to be. They soon took root and grew. The thick leaves resisted the attack of wind-blown sand and the plants multiplied by suckers and bulblets, forming dense hedges. Meanwhile on the leeward sides of these rows were planted rows of Eucalyptus which grew in the protection of the sisal. As each row of Eucalyptus got well started another was planted to the leeward of it. Each successive row was

Strength of the trade wind that has swept top soil from the cattle devastated island of Lanai can be judged by this pua tree, valiant lone sentinel on the north end plateau.—Wentworth photo.

able to grow a little higher because of the protection of the preceding one. Ironwoods of a species which sends up a great number of sucker shoots were planted among the Eucalyptus, the result being, at present, a dense strip of solid vegetation sloping up from the row of sisal on the windward side. Its effectiveness in protecting the land from the wind is strikingly demonstrated at points where there are for some reason gaps in the strip. Here, at each gap, is a swath cut through the vegetation on the leeward side, filled with wind-blown sand, and extending for hundreds of feet down wind. In the shelter of these wind-breaks the forest has completely eliminated wind erosion for a considerable distance.

In addition to the wind-breaks Mr. Munro fenced the area of dry forest to keep out the ranch cattle, thus giving the trees a chance to grow and seed themselves. The result is today perhaps the finest dryland forest in the Hawaiian Islands.

Lanai has a peculiar general topography, not at all like that of the other Hawaiian Islands. The central portion is a plateau, lying between 1500 and 2000 feet altitude, and draining, not toward the coast, but into basins here and there on its surface which have no visible outlets to the sea. A range of mountains more than three thousand feet high lies on the east side of the plateau. On the other side it slopes to the sea, breaking off in some places in high cliffs. The plateau and its depressions are not, according to Dr. Chester K. Wentworth, geologist, the remains of an old crater, as many people believe, but the results of intensive faulting during which great blocks of the original volcanic dome have become shifted and depressed with relation to each other. A number of fault lines and cracks are evident on the face of the great Pali Kaholo on the southwest point of the island when viewed from the sea. The slopes from the edge of the plateau to the sea are barren, dry and badly eroded, supporting nothing but pili grass, cactus, and at the bottom, a kea-we forest. The most interesting regions, botanically, are the mountains and the plateau itself.

Mr. Usinger and I made two trips to the highest portions of the mountains. The first was a traverse of the whole range, from end to end, in company with Mr. Munro. He was able to give us the general lay of the land and point out the locations of many of the rarest plants, some of which are almost extinct. The next day we returned to the summit of Lanaihale, where there is a small cabin, and spent the night and two days in making a hasty survey of the extent and composition of the forest.

Contrary to reports that there are only a few acres of forest remaining on the island, we found that there are thousands of acres of forest in good condition. The region of the summit itself is covered with well-developed,

Unforested land near Kanepuu, topsoil stripped by wind. Catching some of the wind-driven sand, causing it to pile up, can be seen uhaloa (Waltheria americana), redtop (Tricholaena rosea) and horseweed (Erigeron canadensis). In left distance a remnant of native forest which covered this area, destroyed by grazing.—Fosberg photo.

Maunalei Gulch with running stream; kukui trees in water course, upper, and Opuntia megacantha in foreground. The stream is now source of Lanai's principal water supply. — Wentworth photo.

typical, Hawaiian moist forest. The most abundant trees and shrubs in this region are *manono* (*Gouldia*), *ohia lehua* (*Metrosideros*), *kopiko* (*Straussia*), *pilo* (*Coprosma*), *kolea* (*Suttonia*), *oha wai* (*Clermontia*), *kaawau* (*Ilex*), and *naupaka* (*Scaevola*). There is some moss in the trees, and the ground is deeply matted with ferns, mostly staghorns (*Gleichenia*). Of these, all four species in the islands are present, with the giant staghorn (*Gleichenia glauca*), the most abundant, instead of the common one (*G. linearis*).

The low annual rainfall (22 to possibly 40 or 50 inches) calculated by Dr. Wentworth for Lanaihale is by no means edequate to produce such forests as exist there. The explanation of their presence, as pointed out by Mr. Munro, is quite obviously the fog drip. The summits of Lanaihale and Haalelepaakai are capped for a great share of the time by clouds, from which a large amount of moisture condenses on the trees. The presence of a mudhole wherever the trail passed under a lehua tree, and an actual trickle of water from the drip from a large *Leptospermum* tree are evidence of this fact.

On the west side the mountains fall off in a precipitous fault scarp, wooded wherever slope is not too steep. On the other side peculiar flat-topped, steep-sided ridges descend rather gradually. These ridges seem to be exposed, much of the time, to strong winds causing the forest, which is composed largely of the same species as that above, to be dwarfed, and of a dense, matted character. Gradually, as lower and dryer altitudes are reached, it disappears completely, leaving the ridges either bare or in some parts covered with molasses grass.

The valleys between these ridges, on the other hand, support the finest forest left on the island. The trees are large and diversified. In addition to the ones found on the ridges above, here are *ohia ha* (*Eugenia sandwicensis*), *mahame* (*Antidesma*), *mana* (*Xylosma*), *mamaki* (*Pipturus*), *kanawao keokeo* (*Cyrtandra*), *alaa* (*Sideroxylon*), *olomea* (*Perrottetia*), *opuhe* (*Urera*), and many others less common. The whole is tangled with *maile* (*Alyxia*) and *ie ie* (*Freycinetia*). *Amaumau* (*Sadleria*) is the most conspicuous of the many ferns. As one goes toward the mouths of these valleys the forests become dryer. The alaa becomes more abundant. *Pua* (*Osmanthus*) and *papalakipau* (*Pisonia*) finally become the dominant trees and a true dry forest is reached. This gradually gives way to open areas covered with Hilo grass (*Paspalum conjugatum*), molasses grass, and *pamakani* (*Eupatorium adenophorum*). The latter is seriously invading the forests, and due to its abundant seeding, dense habit of growth, and tremendous adaptibility to different conditions, is certainly the most serious menace, at present, to the forests on the higher parts of Lanai. Guava and *Lantana*, elsewhere in the islands so bad, have here been almost eliminated. The most interesting of these gulches, Kaiholena Valley, above Koele, is a magnificent piece of forest and a botanist's paradise.

On the northwest side of the moun-

Kaiholena Valley harbors one of the finest areas of forest left on Lanai. Forest in the foreground is largely pua, that farther back holds many types of trees favored by greater moisture. This Valley might well be called a botanists' paradise, so rich is it in variety of possibilities.—Forbes photo.

tain mass are two tremendous gulches, perhaps they should be called gorges, Maunalei and Hauola. The latter is practically inaccessible from either above or below, and is so deep and narrow that from the ridges on the sides in most places the bottom cannot be seen. In the bottom of the other one, Maunalei, there is a pumping station from which Lanai gets its water supply. Here is the only permanent stream of water on the island. Many interesting dry land plants are found in this gulch, which is accessible by an excellent trail up the steep wall. On the wall is found an interesting sage (*Artemisia*) hitherto only known from Maui. Also on this wall Dr. Rock found the amazing *Brighamia,* looking like a cabbage on a pole, bearing fragrant white flowers, and known only from three other localities in the world, all in the Hawaiian Islands. The plant has apparently disappeared from this place now, at least within sight of the trail, as none were to be seen though we watched carefully for them. They may still occur elsewhere on the unclimable walls of this gulch or of Hauola.

One of the most interesting days of our whole visit to Lanai was spent in the company of Mr. Munro tramping over the north end of the plateau near Kanepuu. The slopes down from the edges of the plateau have been eroded by the wind into a remarkable topography, even resembling in miniature the Garden of the Gods in Colorado. The gently rolling area on top is partially covered by patches of dry forest. This forest is remarkable. It might even be considered an anachronism. It is apparently the sole remaining good example of the type of dry land forest which before the advent of Europeans must have covered great areas in the lowlands of the older islands of the Hawaiian group. Although it is in a large measure composed of such common trees as pua, *naio* or false sandalwood (*Myoporum*), *lama* (*Diospyros*), and others, there persist here a number of species such as *Gardenia Brighami,* formerly abundant on other islands, but now practically extinct. Also there are a number of plants found here and nowhere else. One of these, a small mint, *Haplostachys Munroi,* is restricted to a spot less than one acre in extent.

Mr. Munro, while he was manager of the ranch had this area fenced off and protected from stock. He had a winding road through the forest making accessible most of the rare plants, and had dreams of preserving it as a natural park. He had full realization of the great scientific, historical, and sentimental value of this bit of Hawaii as it was before the coming of plantations, *keawe* (*algaroba*), guava, and lantana, as well as its tremendous practical value in protecting the north end of the island from wind erosion. Furthermore, he had seen Lanai at a period when the forests were at the point of being destroyed, and so realized the shortsightedness of sacrificing the forest for a few years cattle grazing. At present, however, the fences have been removed and the cattle are again feeding in this remarkable area.

Although Lanai has by no means the attractions, from the standpoint of the tourist, offered by the other Hawaiian Islands, it is of such interest to the student of natural history that he would gladly return again and again.

Rana Rugosa Schlegel

Notes on the life history of this interesting frog

By ARTHUR SVIHLA, Ph.D.
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Author of "The Hawaiian Rat" in Mid-Pacific Magazine, Vol. XLVII, No. 4.

ALTHOUGH no indigenous amphibia occur in the Hawaiian Islands, several species of frogs and toads have been introduced since the discovery of these islands by the white man. Some of these have been brought to the Islands intentionally for specific purposes; for example, the bull frog (*Rana catesbians*) was introduced as a supplementary source of food; and more recently the giant toad (*Bufo marinus*) has been introduced from the West Indies to aid in the control of insects injurious to sugar-cane. Two additional species of amphibia are also present. These are a toad (*Bufo asiaticus*) so far known to occur only on the Island of Kauai, and a frog (*Rana rugosa*) which is evidently rather widely distributed in the Islands. These two species do not seem to have been brought to the Islands for any definite purpose but evidently entered unobserved before the present stringent quarantine became effective.

A number of specimens of the frog, *Rana rugosa,* were collected on Oahu and Maui during the summer of 1934. A search through the literature revealed so little information concerning its habits that the following notes seem particularly important and may serve to stimulate further investigation.

Rana rugosa is medium in size, the females having a body length of about two inches while the males are smaller, measuring about an inch and a half. The color is dark green and the specific name of *rugosa* is derived from the presence of a large number of short parallel ridges which run down the back. The undersides are mottled gray with a slight suffusion of yellow. The males may also be detected by the presence of an elongated-ovoid nuptial pad on the outside edge of the basal joint of the thumb and which is absent in the female.

This species of frog is a native of Japan where it occurs on the islands of Hondo, Kiusui and Shikoku (Stejneger 1907), and Korea (Okada 1925). How and when it arrived in the Hawaiian Islands is not known, but since the eggs are very small and inconspicuous it is possible that they may have entered the Islands concealed among the roots of aquatic plants shipped from Japan.

At present this frog is fairly common in the mountain streams on Oahu and Maui. On Oahu I first noticed and collected it in a stream on the windward side of Mt. Kaala at an elevation of 1500 feet. It was also found on the windward side of the Koolau Range in a little stream which runs under the Pali Road just below the crest of the Pali. Here both adults and tadpoles were found during August. On the Island of Maui, collections of adults, egg masses and tadpoles were made from the pools of an intermittent stream at Olinda. Adults and tadpoles were also taken on the windward side of Maui at Nahiku. It would be of great interest to know whether this frog is found on the other islands of the Hawaiian group as well.

In general habits, *Rana rugosa* is a pool or pond dwelling amphibian since it is usually found in or near the shallow pools of the mountain streams. When disturbed, it immediately plunges into the nearest pool and secrets itself under the decaying leaves on the bottom. These frogs are not exceptionally strong or fast swimmers compared to other frogs inhabiting streams. Their dark coloration and rugose appearance helps to make them inconspicuous against the dark rock bottom of shallow pools. Since they do not possess a vocal-sac they are naturally voiceless and therefore have no calls or songs.

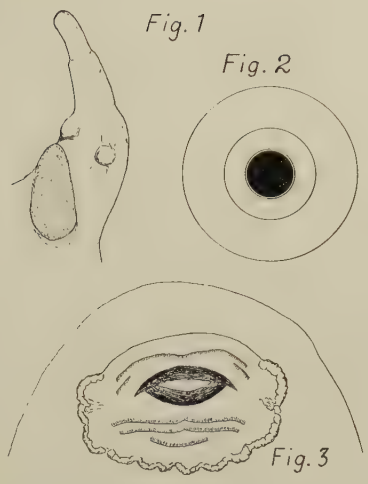
On the island of Maui, observations were made during the third week of July. At this time specimens in all stages of development were collected from the same pool at Olinda. Here, pairs in amplexus, newly laid eggs and tadpoles in all stages of growth, ranging

from those newly hatched to those that had just metamorphosed into frogs, were found. It is unusual to find reproduction taking place so late in the season since amphibia ordinarily breed during the spring of the year.

The elongated-ovoid nuptial excrescence on the outside edge of the lower joint of the male (Fig. 1) is used when clasping the female during amplexus, its rough surface evidently giving the male a better grasp against the slipping sides of the females. This pad is usually larger in older males than in young ones. Amplexus is pectoral as in other frogs of this genus and is performed by the male passing his arms under the armpits of the female and clasping her breast, thus bringing into play the rough patches on the male's thumbs.

The eggs are very small and inconspicuously colored, occurring in clusters of approximately from 130 to 150 eggs. Each cluster averages about 30 by 33 centimeters in extent. The eggs are held together rather closely by the outer jelly coats so that it is difficult to separate a single egg from the mass. The animal pole of the egg varies in color from light tan to dark brown but is not black. The vegetal pole is light tan in color. Each individual egg is approximately 1.5 millimeters in diameter. There are two jelly coats present, an inner one 3.0 millimeters in diameter and an outer one which varies from 5.1 to 6.0 millimeters in diameter (Fig. 2). In the pool where these eggs were collected there was no vegetation except algae so that the eggs lay unattached in the shallow water.

Okada (1925) was the first to describe the tadpoles of this frog but it may not be amiss to repeat the description here. At the time the hind legs appear, the pollywogs approximate 50 millimeters in length of which 27.5 millimeters represents the tail. The greatest width of the body at this time is 16 millimeters. The distance from the tip of the nose to the eyes is 5 millimeters and the interorbital width is 4 millimeters. The muscular portion of the tail is 6 millimeters wide and the greatest width of the tail including the fins is 11 millimeters. Both the upper and lower fins are equal in size. There are present five rows of teeth, two on the upper lip and three on the lower. The first row on the upper lip is continuous and extends across the lip whereas the second row is divided into two short rows situated near the ends of the upper or first row. Sometimes in young specimens this second row is absent. On the lower lip the first two rows are long whereas the third row is short and situated in the center of the lip. The upper row on the lower lip is slightly longer than the second row beneath it. (Fig. 3). The spiracle is sinistral and directed upwards and backwards and is situated closer to the eyes than to the anus. The anus is dextral. In color the tadpoles vary from light brown to almost black and are covered with numerous light grey spots which are very apparent when the tadpoles are examined closely.



One of the striking observations made is the evident prolongation of the breeding season of this frog in the Hawaiian Islands. According to Stejneger (1907) the reproductive season for this species of frog in Japan is during May. Since mating and practically all stages in development were observed during the latter part of July, it may be supposed that the breeding season of this frog has been extended since its introduction into the Hawaiian Islands. This may have been brought about by the breaking down of the breeding rhythm due to the uniformity of the climatic conditions which exist here so that instead of reproduction occurring only during the spring it now continues throughout the summer months as well. Whether reproduction is continuous throughout the year requires further study and investigation.

Literature Cited

Stejneger, L., 1907: Herpetology of Japan. Bulletin 58, U. S. National Museum, pp. 123-127.

Okada, Yaichiro, 1925: Notes on Some Tadpoles from Japan. Annotationes Zoologicae Japonensis, vol. 10, No. 33, pp. 337-348.

A Troublesome Introduced Grass

By EDWARD Y. HOSAKA*

IN HAWAII the *malihini* (newcomer) species are the pests. The *kamaaina* (old timer) plants, insects, birds and other animals have been in intimate relationship for so long that they have established a balance in Nature and cause but little trouble to each other and, incidentally, to man's interests.

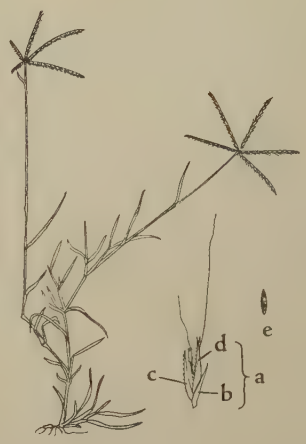
Recently another immigrant species of plant has reached our islands, and has begun to cause trouble in lawns. It is the "star grass", a native of Australia, where it is useful as a forage and range plant. It is known to scientists as *Chloris divaricata,* having been so named by the botanist Robert Brown. It grows very rapidly, sending out, within two weeks, flowering stalks which bear hundreds of seeds capable of giving rise to new plants.

My attention was first called to this grass, a few years ago, by Mr. Albert F. Judd, who had detected it as a newcomer to the islands and a potential troublesome weed. Today it has taken possession of many once beautiful lawns and gardens.

Good examples of its invasions and destructiveness may be seen at the University of Hawaii campus and the grounds of the Kamehameha Boys' School. Here, in places, this grass is crowding out and replacing the Bermuda or Manienie grass (*Cynodon dactylon*) of which most of Honolulu's lawns are composed. It is important to dig the plant out as soon as it appears in order to avoid later trouble.

Dr. A. S. Hitchcock, who identified specimens as this grass, states that it has not been previously reported from the Hawaiian islands. Its distribution and abundance in other parts of the territory is not definitely known to the writer, but it is quite common in Honolulu.

This grass can be easily recognized in a lawn by the flowering panicles which stand above those of the Manienie grass. The accompanying drawing and following nontechnical description of the grass might help to identify it.



Chloris divaricata R. Brown.
a; spikelet
b; first glume
c; second glume
d; lemma. e; seed

Plant ½ to 1 foot high, often the flower panicles stand higher depending on soil moisture; much branching at the lower nodes or joints close to the ground; the whole plant smooth in appearance. Leaves 1½ to 4½ inches long, ⅛ inch wide, upper surface covered with very short hairs, more so toward the base, lower surface sparsely clothed with short, soft white hairs, edges and keel fringed with saw-like spines which are rough to touch, base of leaf where it joins the leaf-sheath with V-shaped white marking; leaf sheath glabrous; ligule very short, membraneous and hair-like at the margin. Flower stalks 5-10 inches long, with 4-7 flowering branches extending out almost horizontally from a common center, flowering spikes 2-4 inches long, light purplish-green when young, yellow or straw-color when old; spikelets close together, with two flowers, a fertile lower one and an infertile upper one; first glume 1/16 or more inch long, narrow and tapering to a point, with 1 green central nerve; second glume ⅛ or more inch long, lanceolate, with 1 central and two lateral dark green nerves; lemma ⅛ or more inch long, with short hairs on the margins, tip split into two short acute lobes, between the lobes is an awn 4/16-6/16 inch long; second floret with lemma similar to the first but smaller and with shorter awn. Seed 3/32 inch long, light color, narrow, triangular, pointed at both ends.

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Fishes of the American Northwest

A Catalogue of the Fishes of Washington and Oregon, With Distributional Records and a Bibliography

By Leonard P. Schultz and Allan C. DeLacy
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*(Third installment, continued. Copies of issues containing first and second installments, while available, 75 cents a copy, postpaid to any address in the world.—*The Editors.)

217. (2283). Artedius lateralis (Girard).

Scorpaenichthys lateralis Girard, Proc. Acad. Nat. Sci. Phila., 7, 1854: 145, San Luis Obispo (Port Harford) Calif.

Artedius lateralis: Jordan and Gilbert 1881f, 1882; Jordan and Jouy 1882; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Starks 1911; Kincaid 1919; Hubbs 1926.

Range: British Columbia to Pt. Conception (Hubbs 1926). Marine. Common. No commercial value.

Records: Puget Sound Region*: Jordan and Gilbert 1881f, 1882; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Kincaid 1919. Seattle*. Hoods Canal near Holly*. San Juan Islands*—Starks 1911.

Coast of Washington: Neah Bay and Cape Flattery—Jordan and Jouy 1882. Cape Johnson*. La Push*. Cape Elizabeth near Taholah*. Pt. Grenville, near Moclips*.

Coast of Oregon: Ecola Rocks*. Cape Falcon*. Cape Foulweather*. Yaquina Head*. Cape Arago*.

218. (2289). Ruscarius meanyi Jordan and Starks.

Ruscarius meanyi Jordan and Starks, Proc. Calif. Acad. Sci., 2nd ser., 5, 1895: 805, pl. 80, Port Orchard, Puget Sound: Kincaid 1919.

Range: Puget Sound. Marine. Common. No commercial value.

Records: Puget Sound Region*: Kincaid 1919. Port Orchard—Jordan and Starks 1895.

219. (2297). Radulinus boleoides Gilbert.

Radulinus boleoides Gilbert, Rept. U. S. Fish Comm., 24, 1898; 26, pl. 1, Santa Catalina Island, Calif.: Starks 1911; Kincaid 1919.

Range: Puget Sound to Santa Catalina Island. Marine. No commercial value.

Records: Puget Sound Region: San Juan Islands—Starks 1911; Kincaid 1919.

220. (2298). Radulinus asprellus Gilbert.

Radulinus asprellus Gilbert, Proc. U.S. Nat. Mus., 13, 1890 (1891): 88, off Oregon and Washington at *Albatross* Stations 3046, 3057, 3058 in 43 to 77 fathoms: Jordan and Starks 1895; Evermann and Goldsborough 1907; Starks 1911; Kincaid 1919.

Range: Burrard Inlet, B.C., to Farallon Islands, California. Marine. No commercial value.

Records: Puget Sound Region: Jordan and Starks 1895; Starks 1911; Kincaid 1919. Seattle*; Admiralty Inlet (*Albatross* Station 4219), and Hoods Canal (*Albatross* Station 4221)—Evermann and Goldsborough 1907. Port Susan*. Saratoga Passage*. San Juan Islands*.

Coast of Washington: Gilbert 1891.
Coast of Oregon: Gilbert 1891.

221. (2301). Triglops beani Gilbert.

Triglops beani Gilbert, Rept. U. S. Fish Comm., 19, 1893 (1895); 426, pl. 28. upper fig., Aleutian Islands and Bristol Bay, at *Albatross* Stations 3214, 3217 and many others in 7¼ to 42 fathoms: Starks 1896, 1911; Evermann and Goldsborough 1907; Kincaid 1919; Fowler 1923.

Range: Alaska to Puget Sound. Marine. Common. No commercial value.

Records: Puget Sound Region*: Starks 1896; Kincaid 1919. Admiralty Inlet (*Albatross* Stations 4205, 4211, 4212, and 4213)—Evermann and Goldsborough 1907. Whatcom Co.*. San Juan Islands*. Str. Juan de Fuca—Gilbert 1895; Fowler 1923.

222. (2304). Prionistius macellus Bean.

Prionistius macellus Bean, Proc. U. S. Nat. Mus., 6, 1883: 355, Carter Bay, British Columbia: Chapman and DeLacy 1933.

Triglops macellus: Starks 1911; Kincaid 1919.

Range: British Columbia and Puget Sound. Marine. No commercial value.

Records: Puget Sound Region*: Starks 1911; Kincaid 1919. Possession Sound*. Saratoga Passage*. San Juan Is.*. Lopez Is.*—Chapman and DeLacy 1933.

223. (—). Pterygiocottus macouni Bean and Weed.

Pterygiocottus macouni Bean and Weed, Trans. Roy. Soc. Canada, 13, 1920: 73, Vancouver Island.

Range: Vancouver Island. Marine. Two specimens known. No commercial value.

Records: Puget Sound Region: Vancouver Island—Bean and Weed 1920. G. V. Wilby, Provincial Museum, B. C., recently took the second specimen of this doubtful species.

224. (2308). Hemilepidotus hemilepidotus (Tilesius). Red Irish Lord.

Cottus hemilepidotus Tilesius, Mem. Acad. St. Petersb., 2, 1810: Sea of Okhotsk.

Hemilepidotus gibbsii: Jordan and Gilbert 1881f. *Hemilepidotus hemilepidotus:* Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Starks 1896, 1911; Meek 1899; Evermann and Goldsborough 1907; Kincaid 1919; Schmidt 1929b; Schultz and Welander 1934. *Hemilepidotus trachurus:* Jordan and Jouy 1882.

Range: Alaska (Kamchatka—Schmidt 1929b) to Monterey Bay. Marine. Common. No commercial value.

RECORDS: Puget Sound Region: Jordan and Gilbert 1881f; Jordan and Starks 1895; Starks 1896; Evermann and Goldsborough 1907; Kincaid 1919. Seattle*. San Juan Islands*—Starks 1911. Pt. Angeles—Meek 1899.

Coast of Washington: Schultz and Welander 1934. Neah Bay—Jordan and Jouy 1882. Cape Johnson*. La Push*. Cape Elizabeth near Taholah*. Pt. Grenville near Moclips*.

Coast of Oregon: Schultz and Welander 1934. Ecola Rocks*. Cape Falcon*. Three Arch Rks. near Oceanside*. Cape Foulweather*. Yaquina Head*. Coos Bay*. Cape Arago*.

225. (2309). CALYCILEPIDOTUS SPINOSUS Ayres. Yellow Irish Lord.

Calycilepidotus spinosus Ayres, Proc. Calif. Nat. Sci., ed. 2, 1, 1855: 81 (76), San Francisco: Hubbs 1928.

Hemilepidotus spinosus: Eigenmann and Eigenmann 1892.

RANGE: Cape Johnson, Washington to Santa Barbara Islands, California (Starks and Morris 1907). Marine. Common. No commercial value.

RECORDS: Coast of Washington: Cape Johnson*—Hubbs 1928.

Columbia River Mouth: Eigenmann and Eigenmann 1892.

Coast of Oregon: Ecola Rocks*. Cape Falcon*. Cape Foulweather*. Yaquina Head*. Cape Arago*.

226. (2310). ASPICOTTUS BISON Girard. Buffalo sculpin.

Aspicottus bison Girard, Proc. Acad. Nat. Sci. Phila., 7, 1854: 130, San Francisco: Girard 1858; Suckley 1860; Jordan and Gilbert 1881f, 1882; Jordan and Jouy 1882.

Enophrys bison: Goode 1884; Eigenmann and Eigenmann 1892; Gilbert 1895; Jordan and Starks 1895; Starks 1896, 1911; Washburn 1901; Evermann and Goldsborough 1907; Kincaid 1919.

RANGE: Alaska to Point Conception, California. Marine. Abundant. No commercial value.

RECORDS: Puget Sound Region*: Girard 1858; Suckley 1860; Jordan and Gilbert 1881f, 1882; Jordan and Jouy 1882; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Kincaid 1919. Seattle*. Meadowdale*. Hoods Canal near Holly*. Pt. Ludlow—Starks 1896; Evermann and Goldsborough 1907. Admiralty Head, Port Townsend—Evermann and Goldsborough 1907. San Juan Islands*—Starks 1911. Pt. Angeles—Gilbert 1895.

Coast of Washington: Cape Elizabeth near Taholah*. Pt. Grenville near Moclips*. Grays Harbor*.

Coast of Oregon: Washburn 1901. Cape Falcon*. Three Arch Rks. near Oceanside*. Cape Foulweather*. Yaquina Head*. Yaquina Bay*. Coos Bay*. Cape Arago*.

227. (2387). BLEPSIAS CIRRHOSUS (Pallas). Silver spot.

Trachinus cirrhosus Pallas, Zoogr. Rosso-Asiat., 3, 1811: 237, Bering Sea.

Blepsias cirrhosus: Günther 1860; Steindachner 1877; Jordan and Gilbert 1881f, 1822; Jordan and Jouy 1882; Eigenmann and Eigenmann 1892; Gilbert 1895; Starks 1896, 1911; Evermann and Goldsborough 1907; Kincaid 1919; Powers 1921. *Blepsias cirrhosus typicus* Schmidt 1929a.

RANGE: Alaska to San Francisco (Schmidt 1929a). Marine. Common. No commercial value.

RECORDS: Puget Sound Region*: Steindachner 1877; Jordan and Gilbert 1881f; 1882; Eigenmann and Eigenmann 1892; Evermann and Goldsborough 1907; Kincaid 1919. Seattle*. Pt. Ludlow—Starks 1896. San Juan Islands*—Starks 1911; Powers 1921. New Orcas Islands—Günther 1860. Pt. Angeles—Gilbert 1895. Str. of Juan de Fuca—Jordan and Jouy 1882.

Coast of Washington: Cape Johnson*.

Coast of Oregon: Cape Arago*.

228. (2389). NAUTICHTHYS OCULOFASCIATUS (Girard). Sailor fish.

Blepsias oculofasciatus Girard, Proc. Acad. Nat. Sci. Phila., 9, 1857 (1858a): 202, Ft. Steilacoom, Wash.

Nautichthys oculofasciatus: Girard 1858; Günther 1860; Suckley 1860; Steindachner 1877; Jordan and Gilbert 1881f, 1882; Jordan and Jouy 1882; Eigenmann and Eigenmann 1892; Gilbert 1895; Jordan and Starks 1895; Starks 1896, 1911; Evermann and Goldsborough 1907; Kincaid 1919.

RANGE: Alaska to Monterey. Marine. Common. No commercial value.

RECORDS: Puget Sound Region*: Suckley 1860; Jordan and Gilbert 1881f, 1882; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Kincaid 1919. Ft. Steilacoom—Girard 1858, 1858a; Günther 1860. Seattle*. Hoods Canal near Holly*. Pt. Ludlow—Starks 1896. Saratoga Passage*. Admiralty Inlet, (*Albatross* Station 4209) and Oak Bay (*Albatross* Station 4219)—Evermann and Goldsborough 1907. Pt. Townsend—Steindachner 1877. San Juan Islands*—Starks 1911. Str. Juan de Fuca—Jordan and Jouy 1882; Gilbert 1895.

229. (2270). SCORPAENICHTHYS MARMORATUS (Ayres). Blue cod. Marbled sculpin. Bull cod.

Hemitripterus marmoratus Ayres, Proc. Calif. Acad. Nat Sci., 1, 1854: 4, San Francisco.

Scorpaenichthys marmoratus: Girard 1858; Jordan and Gilbert 1881f, 1882; Jordan and Jouy 1882; Collins 1892; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Starks 1911; Kincaid 1919.

RANGE: Washington to San Diego. Marine. Common. Slight commercial value.

RECORDS: Puget Sound Region*: Jordan and Gilbert 1881f, 1882; Jordan and Jouy 1882; Collins 1892; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Kincaid 1919. Seattle*. Meadowdale*. Hoods Canal near Holly*. San Juan Islands*—Starks 1911.

Coast of Washington: Cape Johnson*. La Push*. Cape Elizabeth near Taholah*. Pt. Grenville near Moclips*. Grays Harbor*.

Columbia River Mouth: Astoria—Girard 1858.

Coast of Oregon: Ecola Rocks*. Cape Falcon*. Tillamook Bay*. Three Arch Rks. near Oceanside*. Cape Foulweather*. Yaquina Head*. Yaquina Bay*. Cape Arago*.

230. (2314). COTTUS[17] ASPER Richardson. Prickly bullhead.

[17] *Cottus philonips* Eigenmann and Eigenmann, Amer. Nat., 26, 1892: 963, Kicking Horse River, Field, British Columbia, may be a synonym of some species in this region. However, this name was proposed as a substitute for *Cottus microstomus* and is not available (Hubbs and Schultz 1932b).

Cottus asper Richardson, Fauna Bor.-Amer., Fish, 1836: 295, Columbia River Fort Vancouver: Gilbert and Evermann 1895; Seale 1895; Evermann and Meek 1898; Meek 1899; Snyder 1908a; Evermann and Latimer 1910; Crawford 1927; Schultz 1930; Hubbs and Schultz 1932b.

Centridermichthys asper: Richardson 1844; Günther 1860. *Cottopsis asper*: Girard 1851, 1858; Suckley 1860; Jordan and Jouy 1882. *Trachidermis richardsoni:* Heckel 1840.

RANGE: Coastal streams from Alaska to Ventura County, California. Freshwater and in brackish water. Common. Slight commercial value as bait.

RECORDS: Puget Sound Drainage*: Suckley 1860; Jordan and Jouy 1882; Crawford 1927; Schultz 1930. Ft. Steilacoom—Girard 1858. Trib. to L. Cushman*. L. Washington in Seattle*—Gilbert and Evermann 1895; Seale 1895; Evermann and Meek 1898. Sammamish L.* Sultan R.* Anderson Cr. near Holly*. Chimacum*. Whatcom Co.*. L. Sutherland*.

Coast of Washington: Olympic Peninsula* —Meek 1899; Evermann and Latimer 1910. Pleasant L.*. Clallam Co. Quillayute R.*. Quinault R. mouth*. L. Quinault*. Grays Harbor*. Chehalis R. mouth*. Wynooche R.*.

Washington and Oregon: Hubbs and Schultz 1932b.

Washington and Oregon Territories: Günther 1860.

Columbia River Drainage: Richardson 1836, 1844; Heckel 1840; Girard 1851; Günther 1860; Suckley 1860; Jordan and Jouy 1882. Columbia R. mouth*. Klaskanine Cr.*, Clatsop Co., Ore. Astoria, Ft. Dalles—Girard 1858. Cowlitz R. near Kalama*. Kalama R.*. Umatilla R.*. Wallula, Wash.—Gilbert and Evermann 1895. Moses L.*, Grant Co., Wash. Crab Cr.* near Odessa, Wash. Wenatchee R.*

Coast of Oregon: All coastwise streams—Snyder 1908a. Elk Cr. Cannon Beach*. Cr. at Cape Arago*.

231. (2328). COTTUS ALEUTICUS Gilbert.

Uranidea microstoma Lockington, Proc. U. S. Nat. Mus., 3, 1880: 58, St. Paul, Kodiak Island: name preoccupied[17].

Cottus aleuticus Gilbert, Rept. U. S. Fish. Comm., 19, 1893: 418, streams at Unalaska; also in Departure Bay, Vancouver Island: Snyder 1908a; Crawford 1927; Schultz 1930; Hubbs and Schultz 1932b.

RANGE: Coastal streams from Unalaska to Monterey, California. Freshwater. Common. No commercial value.

RECORDS: Puget Sound Drainage: Schultz 1930. L. Washington*. Granite Falls*. Stillaguamish, Skagit, Nooksack—Crawford 1927. Dungeness R.* Anderson Cr. near Holly*.

Coast of Washington: Dickey R.*. Creek one mile south of La Push*. Hoquiam R.*. Satsop R.*.

Washington and Oregon: Hubbs and Schultz 1932b.

Columbia River Drainage: Kalama R.*. St. Helens, Ore.*. Clackamas R., Eagle Cr.*

Coast of Oregon: Youngs R.*, Clatsop Co., Ore. Trask, Tillamook, Nestucca, Yaquina, Coquille, Sixes, and Elk rivers—Snyder 1908a.

232. (2316.) COTTUS EVERMANNI Gilbert.

Cottus evermanni Gilbert, Bull. U. S. Fish. Comm., 17, 1897: 11, fig., Lost River, Ore.

RANGE: Lost River, tributary of Klamath Lake, Oregon. Freshwater.

RECORDS: Coast of Oregon: Lost R.—Gilbert 1898.

233. (2317). COTTUS RHOTHEUS (Rosa Smith). Bullhead.

Uranidea rhothea Smith, Proc. U. S. Nat. Mus., 5, 1882 (1883): 347, Spokane Falls, Wash.

Cottus rhotheus: Gilbert and Evermann 1895; Snyder 1908a; Jordan, Evermann and Clark 1930; Schultz 1930; Hubbs and Schultz 1932b.

RANGE: Columbia River, Kootenay River, Puget Sound Drainage, and Nehalem R., Oregon. Freshwater. Common. Slight commercial value as bait.

RECORDS: Puget Sound Drainage: Schultz 1930. Nisqually R.*. Lynch Cr., Pierce Co.*. Newauken Cr. near Enumclaw*. L. Washington*. Cedar R.*. Evans Cr. near Redmond*. Snoqualmie R.* Raging R. at Falls City*. Wallace R.*

Coast of Washington: Dickey R.*, Soleduck R.*. Lake Cr.*, Clallam Co. Quinault R.*. Humptulips R.*. Satsop R.*.

Washington and Oregon: Hubbs and Schultz 1932b.

Columbia River Drainage: Gilbert and Evermann 1895. Lewis and Clark R.*. Youngs R.*. Klaskanine Cr.*, Clatsop Co., Ore. Kalama*. St. Helens, Ore.*. Willamette R.—Snyder 1908a. Clackamas R.*. S. Fk. John Day R.*. Palouse R.*. Grande Ronde R.*. Minam R.*. Lostine R.*. Naches R.*. Teanaway R.*. Entiat R.*. Spokane R.—Smith 1883. Little Spokane R.*. Dragoon Cr.*. Hangman Cr.*, Tekoa, Wash.—Jordan, Evermann and Clark 1930. Colville R.*.

Coast of Oregon: Nehalem R.*.

234. (2315). COTTUS GULOSUS (Girard). Bullhead.

Cottopsis gulosus Girard, Proc. Acad. Nat. Sci. Phila., 7, 1854: 129, San Mateo Cr. and San Joaquin R., Calif.

Cottus gulosus: Evermann and Meek 1898; Snyder 1908a, 1908b; Evermann and Latimer 1910; Schultz 1930; Hubbs and Schultz 1932b. *Cottus perplexus* Gilbert and Evermann 1895.

RANGE: Alaska to California. Freshwater. Common. Slight commercial value as bait.

RECORDS: Puget Sound Drainage: Schultz 1930. Deschutes R.*. Newauken Cr., near Enumclaw*. L. Washington* and L. Sammamish* —Evermann and Meek 1898. Evans Cr. near Redmond*. Snohomish R.*. Snoqualmie R.*. Raging R. at Falls City.*. Tributary of L. Cushman*. Olympic Peninsula—Evermann and Latimer 1910.

Coast of Washington: Olympic Peninsula —Evermann and Latimer 1910. Soleduck R.*. Cr. one mile south of La Push*. Upper Quinault R.*. Humptulips R.*. Hoquiam R.*. Wynooche R.*. Satsop R.*. Upper tributary of Chehalis R.*. Skookumchuck and Newaukum rivers near Chehalis—Gilbert and Evermann 1895.

Washington and Oregon: Hubbs and Schultz 1932b.

Columbia River Drainage: Lewis and Clark R.*. Klaskanine Cr., Clatsop Co., Ore.*. Trib to Cowlitz near Kalama*. Kalama*. St. Helens, Ore.*. Eagle Cr., trib. to Clackamas R., Ore.*. Umatilla, Ore.*. Ellensburg*.

Coast of Oregon: Coastwise streams—Snyder 1908a. Nehalem R.*. Nestucca R. near Hemlock*. Siuslaw R., Lakes Whoahink, Tsiltcoos, and Tahkenitch—Evermann and Meek 1898. Above Reedsport*. Umpqua R.*. Below Drain*. Rogue R. near Medford*.

Goose Lake Drainage: Drew Creek—Snyder 1908b.

235. (2319, in part 2320). COTTUS PUNCTULATUS (Gill), Rocky Mountain bullhead. Blob.

Potamocottus punctulatus Gill, Proc. Bost. Soc. Nat. Hist., 8, 1861: 40, Bridger Pass, Wyo.

Cottopsis semiscaber Cope: Jordan, Evermann and Clark 1930.

RANGE: Headwaters of Snake River and the Green River of Colorado system, Wyoming, also in the upper Columbia River and upper Missouri system. The record of occurrence of this species in eastern Washington and Oregon by Jordan, Evermann and Clark 1930 probably is not valid, since it has not occurred there in recent collections. Freshwater. Common. Slight commercial value as bait.

236. (2330). COTTUS BELDINGII Eigenmann and Eigenmann. Smooth Bullhead.

Cottus beldingii Eigenmann and Eigenmann, Amer. Nat., 25, 1891: 1132, Lake Tahoe: Hubbs and Schultz 1932b.

Cottus philonips: Gilbert and Evermann 1895. *Cottus punctulatus:* Evermann and Nichols 1909.

RANGE: East of Cascade Mountains in Columbia River Drainage and south to Lake Lahontan (Jordan, Evermann and Clark 1930). Freshwater. Common. No commercial value.

RECORDS: Puget Sound Drainage: Above Snoqualmie Falls*—Gilbert and Evermann 1895.

Washington: Hubbs and Schultz 1932b.

Columbia River Drainage: Walla Walla*. Tucannon R.*. Grande Ronde R.*. Minam R.*. Lostine R.*. Naches R.*. Ellensburg*. Above Moses L., in Crab Creek, Grant Co.*. Upper Crab Creek: Evermann and Nichols 1909. Nason Cr. near Merrit*.

237. (2327). COTTUS KLAMATHENSIS Gilbert.

Cottus klamathensis Gilbert, Bull. U. S. Fish. Comm., 17, 1897 (1898): 10, fig. Upper Klamath Lake, Oregon: Evermann and Meek 1898; Snyder 1908a.

Uranidea minuta: Cope 1884.

RANGE: Klamath River System, Oregon. Freshwater. No commercial value.

RECORDS: Coast of Oregon: Klamath R. drainage—Snyder 1908a. Upper Klamath L.—Cope 1884; Evermann and Meek 1898; Gilbert 1898.

238. (2335). COTTUS PRINCEPS Gilbert.

Cottus princeps Gilbert, Bull. U. S. Fish Comm., 17, 1897 (1898): 12, figure. Upper Klamath Lake, Oregon: Evermann and Meek 1898.

RANGE: Upper Klamath Lake, Oregon. Freshwater. No commercial value.

RECORDS: Klamath Lake (upper): Evermann and Meek 1898; Gilbert 1898.

239. (2336). COTTUS BENDIREI (Bean).

Potamocottus bendirei Bean, Proc. U. S. Nat. Mus., 4, 1881 (1882): 27, Rattlesnake Creek near Camp Harney, Oregon.

Cottus bendirei: Jordan, Evermann, and Clark 1930. *Cottus punctulatus:* Snyder 1908b.

RANGE: Silvies R. and Rattlesnake Creek near Camp Harney, Oregon. Freshwater. No commercial value.

RECORDS: Oregon Lakes: Silvies R.*. Rattlesnake Cr. near Camp Harney, Oregon—Bean 1882. Silver Cr., Harney Co., Oregon—Snyder 1908b. There is no basis for Jordan, Evermann, and Clark's 1930 record for Walla Walla, Washington.

240. (2338). COTTUS MARGINATUS (Bean).

Uranidea marginata Bean, Proc. U. S. Nat. Mus., 4, 1881 (1882): 26, Mill Creek, Walla Walla, Wash.: 1883.

Cottus marginatus: Gilbert and Evermann 1895.

RANGE: Walla Walla River, Washington. Freshwater. No commercial value.

RECORDS: Columbia River Drainage: Walla Walla R.—Bean 1882, 1883; Gilbert and Evermann 1895.

241. (2339). COTTUS TENUIS (Evermann and Meek).

Uranidea tenuis Evermann and Meek, Bull. U. S. Fish Comm., 17, 1897 (1898): 83, fig. 6, Upper Klamath Lake, Klamath Falls, Oregon.

RANGE: Upper Klamath Lake, Oregon. Freshwater. No commercial value.

RECORDS: Coast of Oregon Drainage: Upper Klamath L.—Evermann and Meek 1898.

242. (2351). MYOXOCEPHALUS POLYACANTHOCEPHALUS (Pallas). Great sculpin.

Cottus polyacanthocephalus Pallas, Zoogr. Ross.-Asiat., 3, 1811: 133, Aleutian Islands: Jordan and Gilbert 1881f, 1822; Jordan and Jouy 1882; Goode 1884.

Acanthocottus polyacanthocephalus: Eigenmann and Eigenmann 1892; Gilbert 1895; Jordan and Starks 1895. *Acanthocottus polyacanthocottus* (Pallas): Starks 1896. *Myoxocephalus polyacanthocephalus:* Evermann and Goldsborough 1907; Starks 1911; Kincaid 1919; Powers 1921; Fowler 1923.

RANGE: Bering Sea to Puget Sound. Marine. Common. No commercial value.

RECORDS: Puget Sound Region: Jordan and Gilbert 1881f, 1882; Jordan and Jouy 1882; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Starks 1896; Kincaid 1919. Seattle*. Meadowdale*. Marrowstone Pt., Admiralty Head—Evermann and Goldsborough 1907. Port Angeles—Gilbert 1895. San Juan Islands*—Starks 1911; Powers 1921. Str. Juan de Fuca—Fowler 1923.

Coast of Washington: Cape Flattery—Goode 1884.

243. (—). MALACOCOTTUS KINCAIDI Gilbert and Thompson.[18]

Malacocottus kincaidi Gilbert and Thompson, Proc. U. S. Nat. Mus., 28, 1905: 979, fig. 2, Brinnon, Hoods Canal, Wash.: Kincaid 1919; Hubbs 1928.

RANGE: Burrard Inlet to Puget Sound. Marine. Not rare. No commercial value.

RECORDS: Puget Sound Region*: Kincaid 1919. Hoods Canal*—Gilbert and Thompson 1905; Hubbs 1928.

244. (2379). LEPTOCOTTUS ARMATUS ARMATUS Girard. Bullhead.

Leptocottus armatus Girard, Proc. Acad. Nat. Sci. Phila., 7, 1854: 131, Cape Flattery, Fort Steilacoom, Shoalwater Bay, and other localities: 1858; Ayres 1855; Suckley 1860; Jordan and Gilbert 1881f, 1882; Jordan and Jouy 1882; Eigenmann and Eigenmann 1892; Gilbert 1895; Jordan and Starks

[18] We think the record for *Malacocottus zonurus* at *Albatross* Station 4198 (between Bowen Is. and Nanaimo), may possibly be for *M. kincaidi*, since there are no other records of *M. zonurus* south of Alaska.

1895; Starks 1896, 1911 Evermann and Meek 1898; Evermann and Goldsborough 1907; Kincaid 1919; Powers 1921.

Centridermichthys armatus: Günther 1860. *Leptocottus armatus armatus:* Hubbs 1921.

RANGE: Kodiak Island to Carmel River, California. Marine. Common. No commercial value.

RECORDS: Puget Sound Region*: Girard 1858; Suckley 1860; Jordan and Gilbert 1881f, 1882; Jordan and Jouy 1882; Jordan and Starks 1895; Kincaid 1919; Hubbs 1921. Ft. Steilacoom—Girard 1857a. Seattle*—Evermann and Goldsborough 1907. Meadowdale*. Pt. Ludlow—Starks 1896. Hoods Canal near Holly*. Saratoga Passage*. Pt. Angeles—Gilbert 1895. Sikiu R. mouth, Clallam Co.*, San Juan Islands*—Starks 1911; Powers 1921. New Orcas Islands—Günther 1860.

Coast of Washington: Hubbs 1921. Cape Flattery—Ayres 1855; Girard 1857a, 1858. Quillayute R. mouth*. Quinault R. mouth*. Grays Harbor*. Shoalwater Bay (Willapa)—Girard 1858.

Columbia River Drainage: Mouth*—Eigenmann and Eigenmann 1892.

Coast of Oregon: Hubbs 1921a. Cannon Beach*. Tillamook Bay*. Three Arch Rks. near Oceanside*. Nestucca Bay*. Yaquina Head*. Yaquina Bay*. Siuslaw R. mouth—Evermann and Meek 1898. Coos Bay*.

245. (2381, 2382). OLIGOCOTTUS MACULOSUS Girard. Tide Pool Johnny.

Oligocottus maculosus Girard, Proc. Acad. Nat. Sci. Phila., 8, 1856 (1857a): 133, Tomales Bay, San Francisco: 1858; Suckley 1860; Jordan and Gilbert 1881c, 1881f; Jordan and Jouy 1882; Eigenmann and Eigenmann 1892; Gilbert 1895; Jordan and Starks 1895; Greeley 1901; Starks 1911; Miles 1918; Kincaid 1919; Powers 1921.

Centridermichthys maculosus: Steindachner 1877. *Oligocottus borealis* Jordan and Snyder in Jordan, Proc. Calif. Acad Sci., 2nd ser., 6, 1896: 225, Neah Bay, Wash.: Starks 1896.

RANGE: Okhotsk Sea and southern Alaska south to near Tunitas, San Mateo Co., California (Hubbs 1926a). Marine. Common. No commercial value.

RECORDS: Puget Sound Region*: Girard 1857a; Suckley 1860; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Starks 1896; Greeley 1901; Kincaid 1919. Fort Steilacoom—Girard 1857a, 1858. Fox Inlet—Steindachner 1877. Seattle*. Meadowdale*. Hoods Canal near Holly*. Pt. Angeles—Gilbert 1895. Friday Harbor*—Miles 1918. San Juan Islands*—Starks 1911; Powers 1921. Mouth of Sikiu R., Clallam Co., Wash.*.

Coast of Washington: Neah Bay*—Jordan and Gilbert 1881c, 1881f; Jordan and Snyder in Jordan 1896. Cape Flattery—Jordan and Jouy 1882. Cape Johnson*. La Push*. Pt. Grenville, near Moclips*.

Coast of Oregon: Cape Falcon*. Three Arch Rks. near Oceanside*. Cape Foulweather*. Yaquina Head*. Yaquina Bay*. Ecola Rocks*. Coos Bay*. Cape Arago*.

246. (2381 on p. 2871 and 2384b on p. 3181). DIALARCHUS SNYDERI Greeley. Cirrated sculpin.

Dialarchus snyderi Greeley, Bull. U. S. Fish Comm., 19, 1899: 14, fig. 4, Pacific Grove, Calif.: Hubbs 1926a, 1928.

Oligocottus snyderi Greeley in Jordan and Evermann, Fishes North and Mid. Amer., 1898, 2871, Pacific Grove, Calif. (*nomen nudum*).

RANGE: Queen Charlotte Islands*, Ucluelet*, British Columbia, to Point Loma (Hubbs 1926a), San Diego Co., California. Marine. Common. No commercial value.

RECORDS: Coast of Washington: Hubbs 1928. Cape Johnson*. La Push*. Reef on shore opposite Quillayute Needles*. Cape Elizabeth near Taholah*. Pt. Grenville near Moclips*.

Coast of Oregon: Hubbs 1928. Cape Falcon*. Three Arch Rks. near Oceanside*. Cape Foulweather*. Yaquina Head*. Ecola Rocks*. Cape Arago*.

247. (2383). OXYCOTTUS ACUTICEPS (Gilbert).

Oligocottus acuticeps Gilbert, Rept. U. S. Fish Comm., 19, 1893: 432, Unalaska.

Oxycottus acuticeps: Jordan, Evermann and Clark 1930.

RANGE: Aleutian Islands south to Sausalito, Marin Co., Calif. (Hubbs 1926a). Marine. Common. No commercial value.

RECORDS: Puget Sound Region: Seattle*. Meadowdale*. Hoods Canal near Holly*. Mouth Sikiu R., Clallam Co., Wash.*. San Juan Islands*.

Coast of Washington: Cape Flattery—Jordan, Evermann and Clark 1930. Cape Johnson*. La Push*. Reef opposite Quillayute Needles*. Cape Elizabeth near Taholah*. Pt. Grenville near Moclips.*

Coast of Oregon: Cape Falcon*. Three Arch Rks. near Oceanside*. Cape Foulweather*. Yaquina Head*. Yaquina Bay*. Ecola Rocks*. Cape Arago*.

248. (2384). ALLOCOTTUS EMBRYUM (Jordan and Starks).

Oligocottus embryum Jordan and Starks, Proc. Calif. Acad. Sci., 2nd ser., 5, 1895: 808, pl. 82, Neah Bay, Wash.: Starks 1896.

Oxycottus embryum: Starks 1911; Kincaid 1919.

RANGE: Aleutian Islands to Point Lobos, California, rare southward. Mr. Bolin took several specimens at Point Lobos and one at 40° 23′ 34″ on California coast in Humboldt Co. Marine. Not common. No commercial value.

RECORDS: Puget Sound Region*: Kincaid 1919. Rocks north of Manchester*. Pt. Ludlow—Starks 1896. Friday Harbor*. San Juan Islands*—Starks 1911.

Coast of Washington: Neah Bay—Jordan and Starks 1895. Cape Johnson*. Cape Elizabeth near Taholah*.

Coast of Oregon: Three Arch Rks. at Oceanside*. Yaquina Head*. Ecola Rocks*. Cape Arago*.

249. (2384a on p. 3179). RUSCICULUS RIMENSIS Greeley.

Rusciculus rimensis Greeley, Bull. U. S. Fish. Comm., 19, 1899: 13, fig. 3, Point Lobos, Calif.: Hubbs 1928; Schultz 1930a.

Stelgidonotus latifrons Gilbert and Thompson 1905: Evermann and Goldsborough 1907; Starks 1911; Kincaid 1919.

RANGE: British Columbia to Monterey Co., California. Marine. Not common. No commercial value.

RECORDS: Puget Sound Region: Admiralty Head—Evermann and Goldsborough 1907. San Juan Islands*—Gilbert and Thompson 1905; Starks 1911; Kincaid 1919; Schultz 1930a.

Coast of Washington: Cape Johnson*—Hubbs 1928.

Coast of Oregon: Cape Arago*—Schultz 1930a.

250. (2385a). BLENNICOTTUS GLOBICEPS (Girard). Round-headed sculpin.

Oligocottus globiceps Girard, Pac. R. R. Surv., 10, Pt. 4, Fishes, 1858: 58, South Farallons: Eigenmann and Eigenmann 1892.

Blennicottus globiceps: Jordan and Gilbert 1881c, 1881f, 1882; Jordan and Jouy 1882; Greeley 1901; Starks 1911; Kincaid 1919; Fowler 1923.

Blennicottus globiceps bryosus Jordan and Starks 1895.

RANGE: Kodiak Island, Alaska, to Point Conception, California (Hubbs 1926a). Marine. Common in rocky tide pools. No commercial value.

RECORDS: Puget Sound Region: Jordan and Gilbert 1881c, 1881f, 1882; Eigenmann and Eigenmann 1892; Greeley 1901; Kincaid 1919. San Juan Islands*—Starks 1911. Str. of Juan de Fuca—Fowler 1923.

Coast of Washington: Neah Bay*—Jordan and Starks 1895. Cape Flattery—Jordan and Jouy 1882. Cape Johnson*. La Push*. Reef opposite Quillayute Needles*. Cape Elizabeth near Taholah*. Pt. Grenville near Moclips.*

Coast of Oregon: Cape Falcon*. Three Arch Rks. near Oceanside*. Cape Foulweather*. Yaquina Head*. Yaquina Bay*. Ecola Rks.*. Cape Arago*.

251. (2362). DASYCOTTUS SETIGER Bean. Woolly sculpin.

Dasycottus setiger Bean, Proc. U. S. Nat. Mus., 13, 1890: 42, off Sitkalidak Island, Alaska: Jordan and Starks 1895; Starks 1911; Kincaid 1919.

RANGE: Bering Sea to Puget Sound. Marine. Not rare. No commercial value.

RECORDS: Puget Sound Region*: Jordan and Starks 1895; Kincaid 1919. Off Tulalip*. San Juan Islands*—Starks 1911.

252. (2361). ZESTICELUS PROFUNDORUM (Gilbert).

Acanthocottus profundorum Gilbert, Rept. U. S. Fish Comm., 19, 1893: 423, pl. 27, upper fig., Bering Sea, north of Unalaska, at *Albatross* Station 3328 in 399 fathoms.

RANGE: Bering Sea, Alaska and in great depths off California (Hubbs 1928). This species has not been recorded from Washington and Oregon. Marine. No commercial value.

253. (2394). ASCELICHTHYS RHODORUS Jordan and Gilbert.

Ascelichthys rhodorus Jordan and Gilbert, Proc. U. S. Nat. Mus., 3, 1880 (1881c): 264, Waadda Island, Neah Bay, near Cape Flattery: 1881f, 1882; Jordan and Jouy 1882; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Starks 1896; Kincaid 1919.

RANGE: Alaska (Sitka) to Fort Bragg, California. Marine. Common in tide pools. No commercial value.

RECORDS: Puget Sound Region: Jordan and Gilbert 1881f, 1882; Eigenmann and Eigenmann 1892; Kincaid 1919. Pt. Ludlow—Starks 1896. Deception Pass*. Friday Harbor*. San Juan Islands*.

Coast of Washington: Neah Bay*—Jordan and Gilbert 1881c; Jordan and Starks 1895. Cape Flattery—Jordan and Jouy 1882. Cape Johnson*. La Push*. Reef opposite Quillayute Needles*. Cape Elizabeth near Taholah*.

Coast of Oregon: Cape Foulweather*. Yaquina Head*. Ecola Rocks*. Cape Arago*.

254. (2395). PSYCHROLUTES PARADOXUS Günther. Tadpole sculpin.

Psychrolutes paradoxus Günther, Cat., 3, 1861: 516, Gulf of Georgia: Jordan and Gilbert 1882; Goode 1884; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Starks 1896, 1911; Kincaid 1919.

Psychrolutes zebra: Gilbert 1895; Jordan and Starks 1895.

RANGE: Kodiak Island to Puget Sound. Marine. Common. No commercial value.

RECORDS: Puget Sound Region: Jordan and Gilbert 1882; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Kincaid 1919. Pt. Ludlow—Starks 1896. Pt. Townsend*. Pt. Angeles and Str. Juan de Fuca—Goode 1884; Gilbert 1895. Friday Harbor*. San Juan Islands*—Starks 1911.

255. (2396). GILBERTIDIA SIGALUTES (Jordan and Starks).

Gilbertina sigalutes Jordan and Starks, Proc. Calif Acad. Sci., 2nd ser., 5, 1895: 811, pl. 86, Port Orchard, near Seattle, Wash.

Gilbertidia sigalutes: Gilbert and Thompson 1905; Starks 1911; Kincaid 1919; Hubbs 1928.

RANGE: Puget Sound. Marine. Common. No commercial value.

RECORDS: Puget Sound Region*: Jordan and Starks 1895; Gilbert and Thompson 1905; Kincaid 1919. Off Everett*. Hoods Canal*—Hubbs 1928. San Juan Islands*—Starks 1911.

256. (2393). SYNCHIRUS GILLI Bean. Manacled sculpin.

Synchirus gilli Bean, Proc. U. S. Nat. Mus., 12, 1889: 642, Barclay Sound, B. C.: Evermann and Goldsborough 1907; Chapman and DeLacy 1933.

RANGE: Vancouver Island and Puget Sound. Marine. Rare. No commercial value.

RECORDS: Puget Sound Region: Pt. Townsend—Evermann and Goldsborough 1907. Friday Harbor*, and False Bay*, San Juan Islands—Chapman and DeLacy 1933.

Family 67. RHAMPHOCOTTIDAE

257. (2397). RHAMPHOCOTTUS RICHARDSONI Günther. Northern sea horse. Gruntfish.

Rhamphocottus richardsoni Günther, Ann. Mag. Nat. Hist., 14, 1874: 369, Fort Rupert, B. C.: Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Starks 1896, 1911; Evermann and Goldsborough 1907; Johnson 1918; Kincaid 1919; Fowler 1923.

RANGE: Sitka, Alaska, Puget Sound to Monterey, California (Johnson 1918). Mr. Bolin reports a specimen from Monterey Bay. Marine. Common in Puget Sound. No commercial value.

RECORDS: Puget Sound Region*: Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Johnson 1918; Kincaid 1919. Pt. Ludlow—Starks 1896. Admiralty Inlet (*Albatross* Stations 4205, 4209, and 4212), Hoods Canal*—Evermann and Goldsborough 1907. San Juan Islands*—Starks 1911. Str. Juan de Fuca—Evermann and Goldsborough 1907; Fowler 1923.

Family 68. AGONIDAE Sea poachers. Alligator fishes

258. (2400). HYPSAGONUS QUADRICORNIS (Cuvier and Valenciennes). Four-horned sea poacher.
Aspidophorus quadricornis Cuvier and Valenciennes, Hist. Nat. Poiss., 4, 1829: 162, (221), Kamchatka.
Hypsagonus quadricornis: Gilbert 1895; Evermann and Goldsborough 1907; Heath 1910; Starks 1911; Kincaid 1919.

RANGE: Bering Sea to Puget Sound. Marine. Common. No commercial value.

RECORDS: Puget Sound Region*: Kincaid 1919. Admiralty Inlet *Albatross* Stations 4205 to 4207—Evermann and Goldsborough 1907. San Juan Islands*, Friday Harbor*—Heath 1910; Starks 1911. Str. Juan de Fuca—Gilbert 1895.

259. (2401). STELLERINA XYOSTERNA (Jordan and Gilbert).
Brachyopsis xyosternus Jordan and Gilbert, Proc. U. S. Nat. Mus., 3, 1880: 152, Santa Cruz, Calif.
Stellerina xyosterna: Jordan, Evermann and Clark 1930.

RANGE: Coast of Oregon and California (Jordan, Evermann and Clark 1930). Marine. No commercial value.

RECORDS: We have not been able to verify the Oregon record.

260. (2402). OCCA VERRUCOSA (Lockington).
Brachyopsis verrucosus Lockington, Proc. U. S. Nat. Mus., 3, 1880: 60, Drake Bay, near San Francisco.
Occa verrucosa: Jordan and Evermann 1898.

RANGE: Oregon to central California. Marine. No commercial value.

RECORDS: Coast of Oregon: Jordan and Evermann 1898.

261. (2407). PALLASINA BARBATA AIX Starks.
Pallasina aix Starks, Proc. Calif. Acad. Sci., 2nd ser., 6, 1896: 558, pl. 75, Puget Sound near Pt. Ludlow, Wash.: 1911; Kincaid 1919; Powers 1921.
Pallasina barbata: Jordan and Evermann 1898.
Siphagonus barbatus: Gilbert 1895.

RANGE: Aleutian Islands, Puget Sound to coast of Oregon. Marine. Common. No commercial value.

RECORDS: Puget Sound Region*: Starks 1896; Kincaid 1919. Pt. Angeles*—Gilbert 1895. San Juan Islands*—Starks 1911; Powers 1921.
Coast of Washington: Cape Johnson*.
Coast of Oregon: Jordan and Evermann 1898.

262. (2413). PODOTHECUS ACIPENSERINUS (Tilesius). Common alligatorfish. Sturgeon sea poacher.
Agonus acipenserinus Tilesius, Mém. Acad. St. Petersb., 4, 1811: 422, pl. 11, fig. 163, Unalaska: Günther 1860; Steindachner 1877.
Podothecus acipenserinus: Jordan and Gilbert 1881f, 1882; Jordan and Jouy 1882; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Starks 1896, 1911; Meek 1899; Evermann and Goldsborough 1907; Kincaid 1919; Fowler 1923. *Podothecus peristethus:* Gill 1862b.

RANGE: Alaska to Puget Sound. Marine. Common. No commercial value.

RECORDS: Puget Sound Region: Jordan and Gilbert 1881f, 1882; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Kincaid 1919. Ft. Steilacoom and Pt. Townsend—Steindachner 1877. Simeahmoo, Wash. Territory—Gill 1862b. Seattle*. Saratoga Passage*. Pt. Ludlow—Starks 1896; Evermann and Goldsborough 1907. Whatcom Co.*. Pt. Angeles—Meek 1899. San Juan Islands*—Starks 1911. New Orcades, Gulf of Georgia—Günther 1860. Str. Juan de Fuca—Fowler 1923.
Coast of Washington: Cape Flattery—Jordan and Jouy 1882.

263. (2417). AVERRUNCUS EMMELANE Jordan and Starks. Window-tail sea poacher.
Averruncus emmelane Jordan and Starks, Proc. Calif. Acad. Sci., 2nd ser., 5, 1895: 821, pl. 91, Port Orchard, Puget Sound: Starks 1896, 1911; Evermann and Goldsborough 1907; Kincaid 1919; Fowler 1923.
Xystes axinophrys Jordan and Starks 1895: Starks 1896. (Gilbert (1915) finds this is the young of *A. emmelane*).

RANGE: Alaska, Puget Sound to Monterey, California. Marine. Common. No commercial value.

RECORDS: Puget Sound Region*: Jordan and Starks 1895; Kincaid 1919. Seattle*. Off Everett*. Pt. Ludlow—Starks 1896. Hoods Canal* (*Albatross* Station 4222)—Evermann and Goldsborough 1907. Whatcom Co.*. San Juan Islands*—Starks 1911. Str. Juan de Fuca—Fowler 1923.

264. (2422). BATHYAGONUS NIGRIPINNIS Gilbert. Black sea poacher.
Bathyagonus nigripinnis Gilbert, Proc. U. S. Nat. Mus., 13, 1890 (1891): 89, Coast of Washington at *Albatross* Station 3073, in 477 fathoms: Gilbert 1895; Kincaid 1919.

RANGE: Aleutian Islands to Coast of Washington. Marine. Common. No commercial value.

RECORDS: Puget Sound Region*: Hoods Canal near Holly*. Saratoga Passage*. Gedney Is.*. Whidby Is.*. Off Tulalip*. San Juan Islands*.
Coast of Washington: *Albatross* Station 3073—Gilbert 1891; *Albatross* Station 3343—Gilbert 1895; Kincaid 1919.

265. (2426). XENERETMUS TRIACANTHUS (Gilbert).
Xenochirus triacanthus Gilbert, Proc. U. S. Nat. Mus., 13, 1890 (1891): 91, off coast of California, Ore. and Wash., at *Albatross* stations 2893, 2973 and 3059, in 145, 68, and 77 fathoms: Eigenmann and Eigenmann 1892; Jordan and Starks 1895.
Xeneretmus triacanthus: Kincaid 1919.

RANGE: Washington to San Diego. Marine. No commercial value.

RECORDS: Puget Sound Region*: Jordan and Starks 1895; Kincaid 1919. Hoods Canal near Holly*. Possession Sound*. San Juan Islands*.
Columbia River: Eigenmann and Eigenmann 1892.
Coast of Washington: Gilbert 1891.
Coast of Oregon: Gilbert 1891.

266. (2423). ASTEROTHECA PENTACANTHA (Gilbert).
Xenochirus pentacanthus Gilbert, Proc. U. S. Nat. Mus., 13, 1890 (1891): 91, Coast of Wash. at *Albatross* Station 3076, in 178 fathoms: Evermann and Goldsborough 1907.
Xeneretmus pentacanthus: Starks and Morris 1907.

RANGE: Straits of Juan de Fuca to San Diego (Starks and Morris 1907). Marine. No commercial value.

RECORDS: Puget Sound Region: Admiralty Inlet (*Albatross* Station 4221)—Evermann and

Goldsborough 1907, Straits of Fuca—Starks and Morris 1907.

Coast of Washington: Gilbert 1891. *Albatross* Station 3076—Starks and Morris 1907.

Coast of Oregon: Starks and Morris 1907.

267. (2424). ASTEROTHECA ALASCANA (Gilbert). Gray star-snout.

Xenochirus alascanus Gilbert, Rept. U. S. Fish Comm., 19, 1893 (1895): 438, Unimak Pass, Aleutian Islands, at *Albatross* stations 3216, 3219, and others, in 35 to 138 fathoms.

Xeneretmus alaskanus: Starks 1911; Miles 1918; Kincaid 1919.

RANGE: Alaska to Puget Sound. Marine. No commercial value.

RECORDS: Puget Sound Region: Kincaid 1919. San Juan Islands*—Starks 1911; Miles 1918. Str. Juan de Fuca—Gilbert 1895.

268. (—). ASTEROTHECA INFRASPINATA (Gilbert).

Xeneretmus infraspinatus Gilbert, Proc. Calif. Acad. Sci., 3rd ser., 3, 1904: 262, pl. 27, off Cape Flattery, Wash., in 77 fathoms: Gilbert and Thompson 1905; Starks 1911; Kincaid 1919.

RANGE: Bering Sea (Gilbert and Thompson 1905) to Washington. Marine. No commercial value.

RECORDS: Puget Sound Region: Kincaid 1919. San Juan Islands*—Gilbert and Thompson 1905; Starks 1911.

Coast of Washington: Cape Flattery—Gilbert 1904.

269. (2425). XENOPYXIS LATIFRONS (Gilbert).

Xenochirus latifrons Gilbert, Proc. U. S. Nat. Mus., 13, 1890 (1891): 92, off coast of Oregon and San Diego, at *Albatross* stations 2898, 2935, etc., in 61 and 158 fathoms: Eigenmann and Eigenmann 1892; Evermann and Goldsborough 1907.

Xeneretmus latifrons: Starks and Morris 1907; Starks 1911; Kincaid 1919.

RANGE: Burrard Inlet, B.C., to San Diego, California. Marine. No commercial value.

RECORDS: Puget Sound Region:* Kincaid 1919. Elliott Bay*. Seattle*—Evermann and Goldsborough 1907. Hoods Canal near Holly*. Possession Sound*. Saratoga Passage*. San Juan Islands*—Starks 1911.

Columbia River: Eigenmann and Eigenmann 1892.

Coast of Oregon: *Albatross* Station 3059 Gilbert 1891; Starks and Morris 1907.

270. (2427). ODONTOPYXIS TRISPINOSUS Lockington.

Odontopyxis trispinosus Lockington, Proc. U. S. Nat. Mus., 2, 1879: 328, San Francisco: Jordan and Starks 1895; Starks 1896, 1911; Kincaid 1919.

RANGE: Alaska to Point Loma, California (Starks and Morris 1907). Marine. No commercial value.

RECORDS: Puget Sound Region: Jordan and Starks 1895; Kincaid 1919. Pt. Ludlow—Starks 1896. San Juan Islands*—Starks 1911.

271. (2428). BOTHRAGONUS SWANII (Steindachner).

Hypsagonus swanii Steindachner, Ichth. Beitr., 5, July, Sitzb. Akad. Wiss. 74, 1876 (1877): 192, pl. 4, Pt. Townsend, Wash.

Bothragonus swanii: Eigenmann and Eigenmann 1892; Kincaid 1919; Hubbs 1928; Schultz 1930a.

RANGE: Vancouver Island, Puget Sound, and coast of Washington. Marine. Rare. No commercial value.

RECORDS: Puget Sound Region: Eigenmann and Eigenmann 1892. Pt. Townsend—Steindachner 1877; Kincaid 1919. San Juan Islands*—Kincaid 1919; Schultz 1930a.

Coast of Washington: Cape Johnson*—Hubbs 1928.

272. (2433). ANOPLAGONUS INERMIS (Günther). Smooth sea poacher.

Aspidophoroides inermis Günther, Cat., 2, 1860: 524, Vancouver Island: Eigenmann and Eigenmann 1892; Gilbert 1895; Starks 1896, 1911; Evermann and Goldsborough 1907; Kincaid 1919.

RANGE: Alaska to Columbia River. Marine. Common. No commercial value.

RECORDS: Puget Sound Region: Kincaid 1919. Pt. Ludlow—Starks 1896. Hoods Canal—Evermann and Goldsborough 1907. Whatcom Co.*. San Juan Islands*—Starks 1911. Str. Juan de Fuca—Gilbert 1895.

Columbia River: Eigenmann and Eigenmann 1892.

Family 69. CYCLOPTERIDAE Lumpsuckers

273. (2436). EUMICROTREMUS ORBIS (Günther). Spiny lumpfish.

Cyclopterus orbis Günther, Cat. 3, 1861: 158, Vancouver Island: Goode 1884.

Eumicrotremus orbis: Jordan and Starks 1895; Evermann and Goldsborough 1907; Starks 1911; Kincaid 1919.

RANGE: Aleutian Islands to Puget Sound. Marine. Common. No commercial value.

RECORDS: Puget Sound Region: Jordan and Starks 1895; Kincaid 1919. Hoods Canal and *Albatross* Station 4205 — Evermann and Goldsborough 1907. San Juan Islands*—Starks 1911. Str. Juan de Fuca—Goode 1884.

274. (2438). EUMICROTREMUS VINOLENTUS (Jordan and Starks). Smooth lumpsucker.

Lethotremus vinolentus Jordan and Starks, Proc. Calif. Acad. Sci., 2nd ser., 5, 1895: 827, pl. 94, Puget Sound, near Seattle, Wash.: Kincaid 1919.

RANGE: Puget Sound. Marine. Rare. No commercial value.

RECORDS: Puget Sound Region: Near Seattle—Jordan and Starks 1895; Kincaid 1919. Parr 1926: 29, states that this species is the young of some species of *Eumicrotremus*.

Family 70. LIPARIDIDAE[19] See snails. Rock suckers

275. (2447). POLYPERA GREENI (Jordan and Starks).

Neoliparis greeni Jordan and Starks, Proc. Calif. Acad. Sci., 2nd ser., 5, 1895: 829, pl. 96, figs. 2 and 3, Victoria, B. C.

Liparis greeni: Kincaid 1919. *Polypera greeni:* Burke 1930.

RANGE: Alaska to Puget Sound (Burke 1930). Marine.

RECORDS: Puget Sound Region: Jordan and Starks 1895; Kincaid 1919.

276. (—). POLYPERA BERINGIANUS (Gilbert and Burke).

Cyclogaster (Neoliparis) beringianus Gilbert and Burke, Bull. U. S. Bur. Fish., 30, 1910; 72, Nikolski, Bering Island.

Polypera beringianus: Burke 1930.

[19] The members of this family are of no commercial importance in Washington and Oregon.

RANGE: Alaska to Puget Sound. Marine.

RECORDS: Puget Sound Region: Pt. Townsend —Burke 1930.

277. (2446). LIPARIS FLORAE (Jordan and Starks).

Neoliparis florae Jordan and Starks, Proc. Calif. Acad. Sci., 2nd ser., 5, 1895: 830, pl. 96, fig. 1, Waadda Island, Str. Juan de Fuca.

Liparis florae: Kincaid 1919; Hubbs and Schultz 1934.

RANGE: Washington to Monterey Co., California. Marine. Common.

RECORDS: Puget Sound Region: Kincaid 1919. Deception Pass*. San Juan Islands*. Waadda Island, Str. Juan de Fuca—Jordan and Starks 1895.

Coast of Washington: Hubbs and Schultz 1934. Cape Johnson*. La Push*. Cape Elizabeth near Taholah*. Pt. Grenville near Moclips*.

Coast of Oregon: Hubbs and Schultz 1934. Cape Falcon*. Ecola Rocks*.

278. (2445). LIPARIS MUCOSUS Ayres.

Liparis mucosus Ayres, Proc. Calif. Acad. Nat. Sci., 1, 1855: 22, San Francisco: Burke 1930; Hubbs and Schultz 1934.

RANGE: Cape Johnson to central California (Burke 1930 confused it with *L. florae*). Marine. Rare.

RECORDS: Coast of Washington: Cape Johnson* —Hubbs and Schultz 1934.

279. (2443). LIPARIS RUTTERI (Gilbert and Snyder).

Neoliparis rutteri Gilbert and Snyder, in Jordan and Evermann, Bull. 47, U. S. Nat. Mus., pt. 2, 2108, Ugak Bay, Kodiak Island.

Liparis rutteri: Hubbs and Schultz 1934.

RANGE: Alaska to Oregon. Marine. Not rare.

RECORDS: Coast of Washington: Cape Johnson*; La Push*; Cape Elizabeth near Taholah*; Pt. Grenville near Moclips*—Hubbs and Schultz 1934.

Coast of Oregon: Cape Falcon*. Three Arch Rocks near Oceanside*. Yaquina Head*. Ecola Rocks*. Cape Arago*.

280. (2444). LIPARIS CALLYODON (Pallas).

Cyclopterus callyodon Pallas, Zoogr. Rosso-Asiat., 3, 1811: 75, Kamchatka and Aleutian Islands.

Liparis callyodon: Starks 1911; Kincaid 1919; Burke 1930. *Neoliparis callyodon:* Jordan and Starks 1895; Evermann and Goldsborough 1907.

RANGE: Aleutian Islands to Washington. Marine. Common in Puget Sound.

RECORDS: Puget Sound Region: Jordan and Starks 1895; Kincaid 1919. Deception Pass*. Pt. Angeles—Jordan and Starks 1895. San Juan Islands*—Starks 1911. *Albatross* stations 4205 to 4207—Evermann and Goldsborough 1907.

Coast of Washington: Neah Bay—Evermann and Goldsborough 1907. Cape Johnson*.

281. (2450). LIPARIS CYCLOPUS Günther.

Liparis cyclopus Günther, Cat. 3, 1861: 162, Esquimault Harbor, Vancouver Island: Gilbert 1895; Jordan and Starks 1895; Starks 1911; Kincaid 1919; Burke 1930.

Cyclogaster cyclopus: Eigenmann and Eigenmann 1892.

RANGE: Alaska to Washington (Burke 1930). Marine. Common in Puget Sound.

RECORDS: Puget Sound Region: Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Kincaid 1919. San Juan Islands*—Starks 1911. Str. Juan de Fuca—Gilbert 1895.

282. (2451 and 2448) LIPARIS FUCENSIS Gilbert.

Liparis fucensis Gilbert, Proc. Calif. Acad. Sci., 2nd ser., 5, 1895: 837, and Rept. U. S. Fish Comm., 19, 1893: 447, Pt. Angeles, Str. Juan de Fuca: Gilbert 1895; Jordan and Starks 1895; Starks 1896; Evermann and Goldsborough 1907; Kincaid 1919; Burke 1930; Hubbs and Schultz 1934.

Neoliparus fissuratus Starks 1896: Powers 1921.

RANGE: Alaska to Crescent City, California. Marine. Common.

RECORDS: Puget Sound Region*: Jordan and Starks 1895; Kincaid 1919. Pt. Ludlow—Starks 1896. Admiralty Inlet (*Albatross* stations 4208, 4220) and Hoods Canal—Evermann and Goldsborough 1907. Saratoga Passage*. Pt. Angeles, Str. Juan de Fuca—Gilbert 1895. San Juan Is.*—Powers 1921.

Coast of Washington: Cape Johnson*, La Push*, Reef opposite Quillayute Needles*—Hubbs and Schultz 1934.

Coast of Oregon: Cape Falcon*, Cape Foulweather*, Yaquina Head*, Ecola Rocks*, Cape Arago*—Hubbs and Schultz 1934.

283. (2455). LIPARIS DENNYI Jordan and Starks.

Liparis dennyi Jordan and Starks, Proc. Calif. Acad. Sci., 2nd ser., 5, 1895: 835, pl. 98, Admiralty Inlet near Seattle: Gilbert 1895; Starks 1896, 1911; Gilbert and Thompson 1905; Kincaid 1919; Burke 1930.

RANGE: Alaska to Washington (Burke 1930). Marine. Common.

RECORDS: Puget Sound Region: Jordan and Starks 1895; Kincaid 1919. Pt. Ludlow—Starks 1896. San Juan Islands*—Gilbert and Thompson 1905; Starks 1911. Str. Juan de Fuca*—Gilbert 1895.

284. (2457). LIPARIS PULCHELLUS Ayres.

Liparis pulchellus Ayres, Proc. Calif. Acad. Nat. Sci., 1, 1855: 22, San Francisco: Jordan and Starks 1895; Starks 1896, 1911; Kincaid 1919; Burke 1930.

Cyclogaster pulchella: Eigenmann and Eigenmann 1892.

RANGE: Alaska to California (Burke 1930). Marine. Not rare.

RECORDS: Puget Sound Region*: Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Kincaid 1919. Pt. Ludlow—Starks 1896. Possession Sound*. Anacortes*. San Juan Islands*—Starks 1911.

285. (—). NECTOLIPARIS PELAGICUS Gilbert and Burke.

Nectoliparis pelagicus Gilbert and Burke, Bull. U. S. Bur. Fish., 30, 1910: 82, fig. 27, Bering Sea.

RANGE: North Pacific from Hokkaido, Japan, to southern California (Burke 1930). Marine. Rare.

286. (2468). CAREPROCTUS MELANURUS Gilbert.

Careproctus melanurus Gilbert, Proc. U. S. Nat. Mus., 14, 1891 (1892): 560, off coasts of California and Oregon, at *Albatross* Stations 2840, 2891, and others in 178 to 339 fathoms: Burke 1930.

RANGE: British Columbia to southern California (Burke 1930). Marine. Not rare.

RECORDS: Coast of Oregon: *Albatross* Station 3076—Gilbert 1892.

287. (2469a). CAREPROCTUS CYPSELURUS (Jordan and Gilbert).

Prognurus cypselurus Jordan and Gilbert in Jordan and Evermann, Fishes North and Middle Amer. 1898: 2866, Bogoslof Is., Bering Sea.
Careproctus cypselurus: Burke 1930.

RANGE: Okhotsk Sea, Bering Sea to off the coast of Washington (Burke 1930). Marine.

RECORDS: Coast of Washington: Burke 1930.

288. (2473). PARALIPARIS CEPHALUS Gilbert.

Paraliparis cephalus Gilbert, Proc. U. S. Nat. Mus., 14, 1891 (1892): 561, off California and Oregon, at *Albatross* Station 2919 in 984 fathoms: Burke 1930.

RANGE: Bering Sea to California (Burke 1930). Marine. Rare.

RECORDS: Coast of Washington: *Albatross* stations 3070, 3071—Gilbert 1892.

289. (2475). PARALIPARIS MENTO Gilbert.

Paraliparis mento Gilbert, Proc. U. S. Nat. Mus., 14, 1891 (1892): 562, off coast of Oregon at *Albatross* Station 3071 in 685 fathoms: Burke 1930.

RANGE: Washington to California (Burke 1930). Marine. Rare.

RECORDS: Coast of Oregon: *Albatross* Station 3071—Gilbert 1892.

290. (—). PARALIPARIS DEANI Burke.

Paraliparis deani Burke, Proc. U. S. Nat. Mus., 43, 1912: 571, Stevens Passage, Alaska: Hubbs 1928; Burke 1930.

RANGE: Alaska and California (Hubbs 1928). Marine. Not rare.

RECORDS: This species is not yet recorded from Washington and Oregon.

291. (2477). PARALIPARIS DACTYLOSUS Gilbert.

Paraliparis dactylosus Gilbert, Rept. U. S. Fish Comm., 19, 1893: 469, pl. 34, fig. 2, off Santa Cruz, Calif., at *Albatross* Station 3112 in 296 fathoms: Gilbert and Burke 1912; Burke 1930.

RANGE: Alaska and California (Gilbert and Burke 1912; Burke 1930). Marine. Rare.

RECORDS: This species is not yet recorded from Washington and Oregon.

292. (2478). PARALIPARIS ULOCHIR Gilbert.

Paraliparis ulochir Gilbert, Rept. U. S. Fish Comm., 19, 1893: 441, Gulf of Calif. at *Albatross* Station 3010 in 1005 fathoms.

RANGE: Bering Sea and Gulf of California (Burke 1930). Marine.

RECORDS: This species is not yet recorded from Washington and Oregon.

293. (2479). RHINOLIPARIS BARBULIFER Gilbert.

Rhinoliparis barbulifer Gilbert, Rept. U. S. Fish Comm., 19, 1893: 445, north of Unalaska, at *Albatross* Stations 3237, 3325, and others in 225 to 576 fathoms: Burke 1930.

RANGE: Bering Sea, Okhotsk Sea and California. (Burke 1930). Marine.

RECORDS: This species is not yet recorded from Washington and Oregon.

294. (—). RHINOLIPARIS ATTENUATUS Burke.

Rhinoliparis attenuatus Burke, Proc. U. S. Nat. Mus., 43, 1912: 573, Bering Sea in 576 fathoms.

RANGE: Bering Sea and Monterey Bay (Gilbert 1915). Marine.

RECORDS: This species is not yet recorded from Washington and Oregon.

Family 71. EMBIOTOCIDAE. Viviparous perches. Surf-fishes

295. (1882). CYMATOGASTER AGGREGATUS Gibbons. Perch. Shiner. Viviparous perch.

Cymatogatser aggregatus Gibbons, Proc. Calif. Acad. Nat. Sci. in Daily Placer Times and Transcript, May 18, 1854, San Francisco: Jordan and Gilbert 1881f; Jordan and Jouy 1882; Jordan 1884c; Eigenmann and Eigenmann 1892; Eigenmann and Ulrey 1894; Gilbert 1895; Jordan and Starks 1895; Starks 1896, 1911; Evermann and Meek 1898; Evermann and Goldsborough 1907; Kincaid 1919; Powers 1921; Fowler 1923; Lloyd and Guberlet 1932.
Ditrema aggregatum: Günther 1862. *Holconotus rhodoterus:* Girard 1857, 1858. *Micrometrus aggregatus:* Jordan and Gilbert 1882; Tanner 1890.

RANGE: Southeastern Alaska to Todos Santos Bay, Lower California. Marine. Common. Slight commercial value as bait.

RECORDS: Puget Sound Region*: Girard 1857, 1858; Jordan and Gilbert 1881f, 1882; Jordan and Jouy 1882; Jordan 1884c; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Kincaid 1919. Seattle*—Tanner 1890; Fowler 1923. Meadowdale*. Pt. Ludlow—Starks 1896. Possession Sound*. Saratoga Passage*. Hoods Canal near Holly*. Pt. Townsend—Evermann and Goldsborough 1907. Pt. Angeles—Gilbert 1895. San Juan Islands*—Starks 1911; Powers 1921; Lloyd and Guberlet 1932. "New Orcas Islands"—Günther 1862.

Coast of Washington: Eigenmann and Ulrey 1894. Cape Flattery—Girard 1857, 1858. Quillayute R. mouth*. Quinault R. mouth*. Grays Harbor*.

Columbia River Mouth*: Astoria—Girard 1857, 1858.

Coast of Oregon: Eigenmann and Ulrey 1894. Cannon Beach*. Tillamook Bay*. Nestucca Bay*. Yaquina Head*. Yaquina Bay*. Siuslaw R. mouth*—Evermann and Meek 1898. Coos Bay near Empire*.

296. (1883). BRACHYISTIUS FRENATUS Gill.

Brachyistius frenatus Gill, Proc. Acad. Nat. Sci. Phila., 14, 1862: 275, California coast: Jordan and Gilbert 1881f, 1882; Eigenmann and Eigenmann 1892; Eigenmann and Ulrey 1894; Jordan and Starks 1895; Kincaid 1919.

RANGE: Vancouver Island[20] to San Diego, California (Eigenmann and Ulrey 1894). Marine. Common. Slight commercial value.

RECORDS: Puget Sound Region: Jordan and Gilbert 1881f, 1882; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Kincaid 1919.

297. (1887). TOCICHTHYS ELLIPTICUS (Gibbons). Silver porgy.

Cymatogaster ellipticus Gibbons, Proc. Acad. Nat. Sci. Phila., 7, July 1854; 123, San Francisco: Hubbs 1928.
Ditrema jacksoni: Jordan and Gilbert 1881f, 1882; Jordan 1884c. *Embiotoca jacksoni:* Eigenmann and Eigenmann 1892; Gilbert 1895; Jordan and Starks 1895; Kincaid 1919; Fowler 1923.

RANGE: Cape Johnson, Clallam Co., Washington to southern California (Hubbs 1928). Marine. Common. Slight commercial value.

RECORDS: Puget Sound Region: Jordan and Gilbert 1881f, 1882; Jordan 1884c; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Kincaid 1919. Seattle—Fowler 1923. Pt. Angeles—Gilbert 1895.

[20] G. V. Wilby reports the capture of this species in Departure Bay and Round Is., Dodds Narrows, B. C.

Coast of Washington: Cape Johnson*—Hubbs 1928. La Push*. Pt. Grenville near Moclips*. Grays Harbor*.

Columbia River Mouth*.

Coast of Oregon: Cannon Beach*. Cape Foulweather*. Yaquina Bay*. Ecola Rocks*.

298. (1886). HYPERPROSOPON ARGENTEUM Gibbons. White perch. Wall-eyed surffish.

Hyperprosopon argenteum Gibbons, Proc. Acad. Nat. Sci. Phila., 7, 1854: 105, San Francisco: Eigenmann and Ulrey 1894.

? Ditrema arcuatum: Günther 1862. *Ennichthys megalops* Girard 1857, 1858.

RANGE: Esquimault Harbor, B. C. (Günther 1862) to Lower California. Marine. Common. Slight commercial value.

RECORD: Columbia River Mouth*: Astoria—Girard 1857, 1858; Eigenmann and Ulrey 1894.

Coast of Oregon: Yaquina Bay*. Coos Bay*.

299. (1888). HOLCONOTUS RHODOTERUS Agassiz. Porgy.

Holconotus rhodoterus Agassiz, Amer. Jour. Sci. Arts, 17, May 1854: 368, San Francisco: Girard 1856a, 1857, 1858; Suckley 1860; Hubbs 1928.

Amphistichus argenteus: Eigenmann and Ulrey 1894; Kincaid 1919. *Ennichthys heermanni* Girard 1858.

RANGE: Esquimault Harbor, B. C. (Günther 1866) to Monterey, California. Marine. Common. Slight commercial value.

RECORDS: Puget Sound Region: Suckley 1860. Ft. Steilacoom—Girard 1858. Str. Juan de Fuca*—Kincaid 1919.

Coast of Washington: Cape Flattery—Girard 1858; Eigenmann and Ulrey 1894. James Is. at La Push*. Quinault R. mouth*. Shoalwater (Willapa) Bay—Girard 1858.

Columbia River Mouth*: Astoria—Girard 1856, 1857, 1858.

Coast of Oregon: Cannon Beach*. Mouth of Yaquina Bay*.

300. (1891). TAENIOTOCA LATERALIS (Agassiz)[21] Blue perch.

Embiotoca lateralis Agassiz, Amer. Jour. Sci. Arts, 18, 1854: 356, San Francisco.

Ditrema jacksoni: Günther 1862. *Ditrema laterale:* Günther 1862; Jordan and Gilbert 1881f, 1882; Jordan and Jouy 1882; Washburn 1901. *Embiotoca jacksoni:* Jordan and Gilbert 1881f; Jordan and Starks 1895; Gilbert 1898; Kincaid 1919; Fowler 1923. *Embiotoca perspicabilis* Girard 1856a: 1858; Suckley 1860. *Phanerodon laterale:* Eigenmann and Eigenmann 1892. *Phanerodon lateralis:* Eigenmann and Ulrey 1894. *Taeniotoca lateralis:* Jordan and Starks 1895; Washburn 1901; Starks 1911; Kincaid 1919; Fowler 1923.

RANGE: Vancouver Island to San Benito Island, Lower California (Starks and Morris 1907). Marine. Common. Considerable commercial value.

RECORDS: Puget Sound Region: Suckley 1860; Günther 1862; Jordan and Gilbert 1881f, 1882; Jordan and Jouy 1882; Eigenmann and Eigenmann 1892; Gilbert 1895; Jordan and Starks 1895; Kincaid 1919. Ft. Steilacoom—Girard 1856a, 1858. Seattle*—Fowler 1923. Meadowdale*. Hoods Canal near Holly*. San Juan Islands*—Starks 1911.

Coast of Washington: Cape Johnson*. La Push*. Pt. Grenville near Moclips*. Grays Harbor*.

Coast of Oregon: Washburn 1901. Tillamook Bay*. Cape Foulweather*. Nestucca Bay*. Yaquina Head*. Yaquina Bay*. Ecola Rocks*. Coos Bay*. Cape Arago*.

301. (1892). PHANERODON FURCATUS Girard. White surffish. Forktail perch. Splittail perch.

Phanerodon furcatus Girard, Proc. Acad. Nat. Sci. Phila., 7, 1854: 153, Presidio, San Francisco, Calif.: Starks 1911; Kincaid 1919.

RANGE: Vancouver Island to San Diego. Marine. Common. Slight commercial value.

RECORDS: Puget Sound Region: Kincaid 1919. San Juan Islands*—Starks 1911.

Coast of Washington: Grays Harbor*.

Coast of Oregon: Yaquina Bay*. Coos Bay*.

302. (1896). DAMALICHTHYS VACCA Girard. Pile perch. Silver perch.

Damalichthys vacca Girard, Proc. Acad. Nat. Sci. Phila., 7, 1855 (1856a): 321, Puget Sound: 1858; Suckley 1860; Collins 1892.

Damalichthys argyrosomus: Jordan and Gilbert 1881f, 1882; Jordan and Jouy 1882; Jordan 1884c; Tanner 1890; Eigenmann and Eigenmann 1892; Eigenmann and Ulrey 1894; Gilbert 1895; Jordan and Starks 1895; Starks 1911; Kincaid 1919; Fowler 1923.

RANGE: Vancouver Island to Todos Santos Bay, Lower California. Marine. Common. Considerable commercial value.

RECORDS: Puget Sound Region*: Girard 1858; Suckley 1860; Jordan and Gilbert, 1881f, 1882; Jordan and Jouy 1882; Collins 1892; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Kincaid 1919. Ft. Steilacoom—Girard 1856a, 1858. Seattle*—Tanner 1890; Fowler 1923. Hoods Canal near Holly*. Saratoga Passage*. Pt. Angeles—Gilbert 1895. San Juan Islands*—Starks 1911.

Coast of Washington: Jordan 1884c. Vancouver Island to San Diego—Eigenmann and Ulrey 1894. Grays Harbor*.

Coast of Oregon: Jordan 1884c. Tillamook Bay*. Nestucca Bay*. Yaquina Bay*. Coos Bay*. Cape Arago*.

Family 72. GOBIIDAE[22] Gobies

303. (2537). RHINOGOBIOPS NICHOLSII (Bean).

Gobius nicholsii Bean, Proc. U. S. Nat. Mus., 4, 1881: 469, Departure Bay, British Columbia: Kincaid 1919.

RANGE: British Columbia to southern California. Marine. Not rare.

RECORDS: Puget Sound Region: Kincaid 1919. Hoods Canal near Holly*.

304. (2581). LEPIDOGOBIUS LEPIDUS (Girard).

Gobius lepidus Girard, Pac. R. R. Survey, 10, Pt. 4, Fishes, 1858: 127, 25a, figs. 5 and 6; substitute for *Gobius gracilis* preoccupied.

Lepidogobius gracilis: Jordan and Gilbert 1881f. *Lepidogobius lepidus:* Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Kincaid 1919.

RANGE: Vancouver Island to San Diego, California. Marine. Not rare.

[21] *Embiotoca jacksoni* Agassiz has been confused with *Taeniotoca lateralis* and probably the following references are really for *T. lateralis:* Günther 1862; Jordan and Gilbert 1881f; Eigenmann and Ulrey 1894; Gilbert 1895; Jordan and Starks 1895; Kincaid 1919; Fowler 1923.

[22] This family contains no species of commercial value in Washington and Oregon.

RECORDS: Puget Sound Region: Jordan and Gilbert 1881f; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Kincaid 1919. Hoods Canal near Holly*. Useless Bay, Whidby Is.*. San Juan Islands*.

305. (2582). GILLICHTHYS MIRABILIS Cooper. Long-jawed goby.

Gillichthys mirabilis Cooper, Proc. Calif. Acad. Nat. Sci., 3, 1863: 109, San Diego Bay: Jordan and Gilbert 1881f; Eigenmann and Eigenmann 1892; Kincaid 1919.

RANGE: Puget Sound to Guaymas, Sonora. Marine. Not rare.

RECORDS: Puget Sound Region: Jordan and Gilbert 1881f; Eigenmann and Eigenmann 1892; Kincaid 1919.

306. (2584). QUIETULA Y-CAUDA (Jenkins and Evermann).

Gillichthys y-cauda Jenkins and Evermann, Proc. U. S. Nat. Mus., 11, 1888: 147, Guaymas, Sonora. *Quietula y-cauda:* Jordan and Starks 1895; Kincaid 1919.

RANGE: Vancouver Island to Guaymas, Sonora. Marine. Not rare.

RECORDS: Puget Sound Region: (Saanich Arm, Vancouver Is.—Jordan and Starks 1895; Kincaid 1919.)

307. (2586 and 2587). CLEVELANDIA IOS (Jordan and Gilbert).

Gobiosoma ios Jordan and Gilbert, Proc. U. S. Nat. Mus., 5, 1882: 437, Saanich Arm, Vancouver Island. *Clevelandia ios:* Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Gilbert 1904; Kincaid 1919. *Clevelandia longipinne:* Eigenmann and Eigenmann 1892.

RANGE: Vancouver Island to San Diego. Marine. Common.

RECORDS: Puget Sound Region*: Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Gilbert 1904; Kincaid 1919. Hoods Canal*—Kincaid 1919. San Juan Islands*.

Coast of Washington: Cape Elizabeth near Taholah*. Grays Harbor*.

Coast of Oregon: Tillamook Bay*. Coos Bay*.

Family 73. ECHENEIDAE

308. (2606). REMORA REMORA (Linnaeus). Remora. Shark sucker.

Echeneis remora Linnaeus, Syst. Nat. Ed., 10, 1758: 260, Pelago Indico. *Echeneis naucrates* and *Remora remora:* Eigenmann and Eigenmann 1892.

RANGE: Warm seas north to New York and north to Vancouver Island.

RECORDS: Specimen taken off a sulphur bottom whale at Seechart, Vancouver Island, June 1907, by T. Kermode; now in Provincial Museum, Victoria.

Columbia River Mouth: Eigenmann and Eigenmann 1892.

Family 74. AMMODYTIDAE. Sand launces or lances

309. (1214). AMMODYTES TOBIANUS PERSONATUS Girard. Sand launce.

Ammodytes tobianus Linnaeus, Syst. Nat., Ed. 10, 1758: 247: Ayres 1855.

Ammodytes personatus Girard, Proc. Acad. Nat. Sci. Phila., 8, 1856 (1857a): 137, Cape Flattery, Wash.: 1857, 1858; Günther 1862; Jordan and Gilbert 1882; Eigenmann and Eigenmann 1892; Gilbert 1895; Jordan and Starks 1895; Starks 1896, 1911; Evermann and Meek 1898; Washburn 1901; Kincaid 1919. *Ammodytes (Tobianus) personatus:* Jordan and Gilbert 1881f.

RANGE: Alaska to southern California. Marine. Abundant. Of commercial value as bait; forming the bulk of the food for many of our food fishes.

RECORDS: Puget Sound Region*: Jordan and Gilbert 1881f, 1882; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Kincaid 1919. Seattle*. Pt. Ludlow—Starks 1896. Pt. Angeles—Gilbert 1895. San Juan Islands*—Starks 1911. Mouth Sikiu R., Clallam Co., Wash.*.

Coast of Washington: Neah Bay—Gilbert 1895. Cape Flattery—Ayres 1855; Girard 1857, 1857a, 1858; Günther 1862. Grays Harbor*.

Coast of Oregon: Washburn 1901. Tillamook Head*. Three Arch Rks. near Oceanside*. Yaquina Head*. Ecola Rocks*. Siuslaw R.—Evermann and Meek 1898. Cape Arago*.

Family 75. BATHYMASTERIDAE Ronquils

310. (2627). RONQUILUS JORDANI (Gilbert). Ronquil.

Bathymaster jordani Gilbert, Proc. U. S. Nat. Mus., 11, 1888: 554, Elliott Bay at Seattle: 1895; Eigenmann and Eigenmann 1892. *Bathymaster signatus:* Jordan and Gilbert 1881f, 1882; Jordan and Jouy 1882; Goode 1884. *Ronquilus jordani:* Jordan and Starks 1895; Evermann and Goldsborough 1907; Starks 1911; Kincaid 1919.

RANGE: Alaska to Puget Sound. Marine. Common. No commercial value.

RECORDS: Puget Sound Region*: Jordan and Gilbert 1881f, 1882; Jordan and Jouy 1882; Goode 1884; Jordan and Starks 1895; Kincaid 1919. Seattle*—Gilbert 1888. Admiralty Inlet (*Albatross* Stations 4209, 4212, 4213, 4220) and Hoods Canal*—Evermann and Goldsborough 1907. Possession Sound*. Saratoga Passage*. San Juan Islands*—Starks 1911.

Coast of Washington: Neah Bay, Str. Juan de Fuca—Gilbert 1895.

Family 76. ZAPRORIDAE Flaccid Fishes

311. (1372a on p. 2850). ZAPRORA SILENUS Jordan. Highbrow.

Zaprora silenus Jordan, Proc. Calif. Acad. Sci., 2nd ser., 6, 1896: 203, pl. 20, Nanaimo, Vancouver Island: Evermann and Goldsborough 1907; Halkett 1913; Kincaid 1919; Dymond 1928.

RANGE: Sitkalidak Island*, Alaska to Puget Sound. Marine. Rare. No commercial value.

RECORDS: Puget Sound Region*: Kincaid 1919. Nanaimo Harbor, B. C.—Evermann and Goldsborough 1907; Halkett 1913; Dymond 1928.

Family 77. CLINIDAE Southern Blennies

312. (—). GIBBONSIA ELEGANS MONTEREYENSIS[23] Hubbs. Spotted kelpfish.

Gibbonsia elegans montereyensis Hubbs, Papers Mich. Acad. Sci. Arts and Letters, 7, 1926: 354, reef at Pacific Grove, Calif.: 1928.

[23] As this goes to press, G. V. Wilby loaned us for examination two small specimens of *Gibbonsia metzi* Hubbs, taken from Vancouver Is, 49° 36′ N. 126° 43 1/4′ W. on July 10, 1934.

RANGE: (Vancouver Island ?) and southern California. Marine. No commercial value.

RECORDS: Puget Sound Region: Recorded north of California only from Vancouver Island, British Columbia—Hubbs 1928.

313. (2688). HETEROSTICHUS ROSTRATUS[23] Girard. Kelpfish.

Heterostichus rostratus Girard, Proc. Acad. Nat. Sci. Phila., 7, 1854: 143, San Diego, Calif.: Hubbs 1928.

RANGE: (British Columbia) and southern California and Guadalupe Islands. Marine. No commercial value.

RECORDS: Recorded north of California only from British Columbia.

Fimily 78. PHOLIDIDAE[24] Northern Blennies

314. (2766 and 2767). APODICHTHYS FLAVIDUS Girard.

Apodichthys flavidus Girard, Proc. Acad. Nat. Sci. Phila., 7, 1854: 150, Presidio, Calif.: Jordan and Gilbert 1881c, 1881f, 1882; Jordan and Jouy 1882; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Starks 1896, 1911; Evermann and Goldsborough 1907; Kincaid 1919.
Apodichthys inornatus Gill 1862. *Cebidichthys violaceus:* Girard 1858.

RANGE: Alaska (Cape Bendal* and Port Conclusion*) to Pt. Conception. Marine. Common.

RECORDS: Puget Sound Region: Gill 1862; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Kincaid 1919. Ft. Steilacoom—Girard 1858. Seattle*. Meadowdale*. Pt. Ludlow—Starks 1896. Deception Pass*. San Juan Islands*—Starks 1911. Sucia Islands—Evermann and Goldsborough 1907. Mouth Sikiu R.*, Clallam Co., Wash.

Coast of Washington: Neah Bay—Jordan and Gilbert 1881c, 1881f, 1882; Jordan and Jouy 1882. Cape Flattery—Jordan and Jouy 1882. Cape Johnson*. La Push*. Quillayute R. mouth*. Cape Elizabeth near Taholah*.

Coast of Oregon: Cape Falcon*. Cape Foulweather*. Yaquina Head*. Ecola Rocks*. Coos Bay*. Cape Arago*.

315. (2768). XERERPES FUCORUM (Jordan and Gilbert). Fucus blenny.

Apodichthys fucorum Jordan and Gilbert, Proc. U. S. Nat. Mus., 3, 1880: 139, Point Pinos, near Monterey, Calif.: 1881c, 1881f, 1882; Eigenmann and Eigenmann 1892.
Xererpes fucorum: Jordan and Starks 1895; Kincaid 1919.

RANGE: Puget Sound to San Clemente Island. Marine. Not rare.

RECORDS: Puget Sound Region: Jordan and Gilbert 1881f, 1882; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Kincaid 1919. San Juan Islands*.

Coast of Washington: Neah Bay—Jordan and Gilbert 1881c. Cape Johnson*. La Push*.

Coast of Oregon: Cape Foulweather*. Yaquina Head*. Ecola Rocks*. Cape Arago*.

316. (2774, part), PHOLIS ORNATUS (Girard).[25] Saddled blenny.

Gunnellus ornatus Girard, Proc. Acad. Nat. Sci. Phila., 7, 1854: 149, Presidio, Calif.: 1858: Suckley 1860.
Centronotus nebulosus: Günther 1861. *Muraenoides ornatus:* Jordan and Gilbert 1881f, 1882; Jordan and Jouy 1882; Eigenmann and Eigenmann 1892. *Pholis ornatus:* Gilbert 1895; Jordan and Starks 1895; Starks 1896, 1911; Evermann and Goldsborough 1907; Miles 1918; Kincaid 1919; Hubbs 1927.

RANGE: Alaska to San Francisco (Hubbs 1927). Marine. Common.

RECORDS: Puget Sound Region: Suckley 1860; Jordan and Gilbert 1881f, 1882; Jordan and Jouy 1882; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Kincaid 1919. Ft. Steilacoom—Girard 1858. Deception Pass*. Hoods Canal near Holly*. Pt. Ludlow*—Starks 1896. Whidby Island*, Admiralty Head, Port Townsend—Evermann and Goldsborough 1907. Pt. Angeles—Gilbert 1895. San Juan Islands*—Starks 1911; Miles 1918. "New Orcas Islands"—Günther 1861.

Coast of Washington: Cape Flattery—Jordan and Jouy 1882. Cape Johnson*. La Push*. Quillayute R. mouth*. Cape Elizabeth near Taholah*. Grays Harbor*. Shoalwater (Willapa) Bay—Girard 1858.

Columbia River Mouth*.

Coast of Oregon: Cape Falcon*. Tillamook Bay*. Three Arch Rocks near Oceanside*. Nestucca Bay*. Yaquina Head*. Yaquina Bay*. Ecola Rocks*. Coos Bay*.

317. (2774, part). PHOLIS LAETUS (Cope). Bracket blenny.

Centronotus laetus Cope, Proc. Amer. Phil. Soc., 13, 1873: 27, Sitka or Unalaska.
Muraenoides laetus: Jordan and Gilbert 1881c, 1881f, 1882.

RANGE: Alaska to Del Norte County, California. Marine. Common.

RECORDS: Puget Sound Region: Jordan and Gilbert 1881f, 1882. Manchester Rks.*. Seattle*. Bainbridge Is.*. Meadowdale*. Pt. Orchard*. Hoods Canal near Holly*. Possession Sound*. San Juan Islands*.

Coast of Washington: Neah Bay—Jordan and Gilbert 1881c. Cape Johnson*. La Push*. Quillayute R. mouth*.

Coast of Oregon: Cape Falcon*. Cape Foulweather*. Yaquina Head*. Ecola Rocks*. Cape Arago*.

318. (—). PHOLIS SCHULTZI Hubbs.

Pholis schultzi Hubbs in Schultz 1931a: Hubbs 1928, *nomen nudum.*

RANGE: San Juan Island, Coasts of Washington, Oregon, and Del Norte County, California. Marine. Not rare.

RECORDS: Puget Sound Region: reef* at lighthouse, west shore, San Juan Is.

Coast of Washington: Hubbs 1928. Cape Johnson*. La Push*. Quillayute R. mouth*. Cape Elizabeth near Taholah*.

Coast of Oregon: Hubbs 1928. Yaquina Head*. Ecola Rocks*. Cape Arago*.

Family 79. STICHAEIDAE[26] Northern blennies

[24] This family contains no species of commercial value.

[25] All records for this species have been confused by recent authors with *Pholis laetus.*

[26] *Allolumpenus hypochromus* Hubbs and Schultz (1932a) was described from Newcastle Is. near Nanaimo, British Columbia. Only one specimen is known.

319. (2756). BRYOSTEMMA NUGATOR Jordan and Williams. Ornamented blenny.

Bryostemma nugator Jordan and Williams, in Jordan and Starks, Proc. Calif. Acad. Sci., 2nd ser., 5, 1895: 843, pl. 101, Seattle, Wash.: Kincaid 1919.

RANGE: Washington to Fort Bragg, California. Marine. Common. No commercial value.

RECORDS: Puget Sound Region: Jordan and Starks 1895; Kincaid 1919. San Juan Islands*.

Coast of Washington: Cape Johnson*. La Push*. Opposite Quillayute Needles*.

Coast of Oregon: Cape Foulweather*. Yaquina Head*. Ecola Rocks*. Cape Arago*.

320. (2764). BRYOSTEMMA DECORATUM Jordan and Snyder. Decorated blenny.

Bryostemma decoratum Jordan and Snyder, Proc. U. S. Nat. Mus., 25, 1903: 615, Point Orchard, near Seattle, Wash.

Bryostemma polyactocephalum: Jordan and Starks 1895; Kincaid 1919.

Bryostemma polyactocephalus: Evermann and Goldsborough 1907. *Chirolophus polyactocephalus:* Gilbert 1895.

RANGE: Being Sea*, Petersburg*, Alaska and Puget Sound Region. Marine. Not common. No commercial value.

RECORDS: Puget Sound Region*: Jordan and Starks 1895. Point Orchard—Jordan and Snyder 1903. Off Everett*. Admiralty Inlet (*Albatross* Station 4205)—Evermann and Goldsborough 1907. Friday Harbor*—Kincaid 1919. Str. Juan de Fuca—Gilbert 1895.

321. (2777). ANOPLARCHUS PURPURESCENS PURPURESCENS Gill. Crested blenny.

Anoplarchus purpurescens Gill, Proc. Acad. Nat. Sci. Phila., 13, 1861: 262, Washington Territory.

Anoplarchus alectrolophus: Jordan and Gilbert 1881f, 1882; Jordan and Jouy 1882; Bean and Bean 1896. *Anoplarchus atropurpureus:* Jordan and Gilbert 1881c; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Starks 1896, 1911; Evermann and Goldsborough 1907; Miles 1918; Kincaid 1919. *Anoplarchus purpurescens purpurescens:* Hubbs 1927; Schultz and DeLacy 1932. *Cebidichthys violaceus:* Girard 1858.

RANGE: Southeastern Alaska to San Francisco. Marine. Common. No commercial value.

RECORDS: Puget Sound Region: Jordan and Gilbert 1881f, 1882; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Kincaid 1919; Hubbs 1927. Ft. Steilacoom—Girard 1858. Seattle*—Schultz and DeLacy 1932. Seattle and Pt. Townsend—Bean and Bean 1896. Meadowdale*. Deception Pass*. Hoods Canal near Holly*. Pt. Townsend—Evermann and Goldsborough 1907. San Juan Islands*—Starks 1911. Friday Harbor* and Brown Is.*—Miles 1918. Washington Territory—Gill 1862.

Coast of Washington: Cape Flattery—Jordan and Jouy 1882. Cape Johnson*. La Push*.

Coast of Oregon: Cape Foulweather*. Yaquina Head*. Cape Arago*.

322. (2787). PLECTOBRANCHUS EVIDES Gilbert. Barred blenny.

Plectobranchus evides Gilbert, Proc. U. S. Nat. Mus., 13, 1890 (1891): 102, coasts of Oregon and Wash.: Eigenmann and Eigenmann 1892; Gilbert and Thompson 1905; Kincaid 1919.

RANGE: Washington to San Diego (Gilbert 1915). Marine. Not common. No commercial value.

RECORDS: Puget Sound Region*: Kincaid 1919. Hoods Canal*—Gilbert and Thompson 1905. Holly*. Possession Sound*. Port Susan*. Saratoga Passage*.

Columbia River: Eigenmann and Eigenmann 1892.

Coast of Washington and Oregon: *Albatross* Station 3064—Gilbert 1891.

323. (2781). XIPHISTER MUCOSUS (Girard).

Xiphidion mucosum Girard, Pac. R. R. Surv., 10, pt. 4, Fishes, 1858: 119, South Farallon Islands, off Calif.: Jordan and Starks 1895; Starks 1896, 1911; Miles 1918; Kincaid 1919.

Xiphister mucosus: Jordan and Gilbert 1881c, 1881f, 1882; Bean, T. H., 1884; Eigenmann and Eigenmann 1892; Hubbs 1927.

RANGE: Southeastern Alaska to central California (Hubbs 1927). Marine. Common. Slight commercial value.

RECORDS: Puget Sound Region*: Jordan and Gilbert 1881f, 1882; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Kincaid 1919. Pt. Ludlow—Starks 1896. Pt. Townsend—Bean, T. H. 1884. San Juan Islands*—Starks 1911. Brown Is. at Friday Harbor*—Miles 1918.

Coast of Washington: Neah Bay*—Jordan and Gilbert 1881c. Cape Johnson*. La Push*.

Coast of Oregon: Three Arch Rks. near Oceanside*. Cape Foulweather*. Yaquina Head*. Ecola Rocks*. Cape Arago*. Port Orford*.

324. (2782). EPIGEICHTHYS ATRO-PURPUREUS (Kittlitz). Rock blenny.

Ophidium atro-purpureum Kittlitz, Denkwürd. Reise Russ.-Amer., 1, 1858: 225, Alaska.

Epigeichthys atro-purpureus: Hubbs 1927. *Xiphidion rupestre:* Jordan and Starks 1895; Starks 1896; Kincaid 1919. *Xiphister rupestris* Jordan and Gilbert 1881c, 1881d, 1881f; Eigenmann and Eigenmann 1892.

RANGE: Alaska to Santa Barbara (Hubbs 1927). Marine. Common. Slight commercial value.

RECORDS: Puget Sound Region: Jordan and Gilbert 1881; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Kincaid 1919. Pt. Ludlow—Starks 1896. San Juan Islands*.

Coast of Washington: Neah Bay*—Jordan and Gilbert 1881c, 1881d. Cape Johnson*. La Push*.

Coast of Oregon: Cape Foulweather*. Yaquina Head*. Cape Arago*.

325. (2779 and 2780). PHYTICHTHYS CHIRUS CHIRUS (Jordan and Gilbert). Belted blenny.

Xiphister chirus Jordan and Gilbert, Proc. U. S. Nat. Mus., 3, 1880: 135, Point Pinos, near Monterey, Calif.: 1881f, 1882; Eigenmann and Eigenmann 1892.

Phytichthys chirus chirus: Hubbs 1927. *Xiphistes chirus:* Jordan and Starks 1895; Starks 1896, 1911; Miles 1918; Kincaid 1919. *Xiphistes ulvae* Jordan and Starks 1895.

RANGE: British Columbia to central California (Hubbs 1927). Marine. Common. No commercial value.

RECORDS: Puget Sound Region: Jordan and Gilbert 1881f, 1882; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Kincaid 1919. Pt. Ludlow—Starks 1896. San Juan Islands*—Starks 1911. Friday Harbor—Miles 1918.

Coast of Washington: Neah Bay*—Jordan and Starks 1895. La Push*. Cape Johnson*.

Coast of Oregon: Three Arch Rks. near Oceanside*. Cape Foulweather*.

326. (2789). POROCLINUS ROTHROCKI Bean.
Poroclinus rothrocki Bean, Proc. U. S. Nat. Mus., 13, 1890: 40, *Albatross* Station 2952.
RANGE: Alaska to San Diego, California. (Starks and Morris 1907). Marine. Rare. Of no commercial value.
RECORDS: Puget Sound Region*: Off Tulalip*. Saratoga Passage*. Port Susan*.

327. (2788). LEPTOCLINUS MACULATUS (Fries).
Clinus maculatus Fries, Kgl. Vet. Ak. Handl., 1837: 51, Bohüsläan, Sweden.
Leptoclinus maculatus: Chapman and DeLacy 1933.
RANGE: North Atlantic, North Pacific, southward to Puget Sound* (Chapman and DeLacy 1933). Marine. Probably common. No commercial value.
RECORDS: Puget Sound Region: Orcas Island* —Chapman and DeLacy 1933.

328. (2791). LUMPENUS ANGUILLARIS (Pallas). Snake eel.
Blennius anguillaris Pallas, Zoogr. Rosso-Asiat., 3, 1811: 176, about Kamchatka; not of Peck.
Lumpenus anguillaris: Girard 1858; Suckley 1860; Jordan and Gilbert 1881f, 1882; Jordan and Jouy 1882; Eigenmann and Eigenmann 1892; Gilbert 1895; Jordan and Starks 1895; Starks 1896, 1911; Evermann and Goldsborough 1907; Kincaid 1919. *Stichaeus anguillaris:* Günther 1861.
RANGE: Alaska to San Francisco. Marine. Common. No commercial value.
RECORDS: Puget Sound Region: Jordan and Gilbert 1881f, 1882; Jordan and Jouy 1882; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Kincaid 1919. Seattle*—Evermann and Goldsborough 1907. Off Everett*. Whidby Island*. Hoods Canal*. Pt. Ludlow —Starks 1896. Bellingham Bay—Girard 1858; Suckley 1860. Whatcom Co.*. San Juan Islands*—Starks 1911. "New Orcas Islands"—Günther 1861. Pt. Angeles—Gilbert 1895.
Coast of Washington: Grays Harbor*.
Columbia River mouth: Chinnok, Wash.*.

329. (2800). LYCONECTES ALEUTENSIS Gilbert. Red Devil.
Lyconectes aleutensis Gilbert, Rept. U. S. Fish Comm., 19, 1893: 452, pl. 34, near Unalaska: Gilbert and Thompson 1905; Starks 1911; Kincaid 1919; Hubbs 1928; Schultz 1930a.
RANGE: Aleutian Islands to Puget Sound. Marine. Not common. No commercial value.
RECORDS: Puget Sound Region*: Kincaid 1919. Hoods Canal*—Gilbert and Thompson 1905; Hubbs 1928. San Juan Islands*—Starks 1911. Orcas Is.*—Schultz 1930a.

330. (2798). DELOLEPIS GIGANTEUS (Kittlitz.)
Ophidium giganteum Kittlitz, Denkwürd. Reise Russ.-Amer., 1858: 226, Siberia.
Delolepis giganteus: Hubbs 1928. *Delolepis virgatus:* Bean, T. H. 1884; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Kincaid 1919.
RANGE: Southeastern Alaska to southern Oregon. Marine. Not rare. No commercial value.
RECORDS: Puget Sound Region: Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Kincaid 1919. Seattle*. Whidby Island*. Pt. Angeles—Bean, T. H. 1884.
Coast of Oregon: Yaquina Bay*. Heceta Head*—Hubbs 1928. Coquille R. mouth.*

Family 80. PTILICHTHYIDAE

331. (2810). PTILICHTHYS GOODEI Bean. Quill fish.
Ptilichthys goodei Bean, Proc. U. S. Nat. Mus., 4, 1881: 157, Port Levasheff, Unalaska: Schultz 1929b, 1930a; Chapman and DeLacy 1933.
RANGE: Alaska to Puget Sound. Marine. Not common. No commercial value.
RECORDS: Puget Sound Region: Friday Harbor* —Schultz 1929b, 1930a; Chapman and DeLacy 1933.

Family 81. ANARRHICHTHYIDAE Wolf-fishes

332. (2806). ANARRHICHTHYS OCELLATUS Ayres. Wolf eel.
Anarrhichthys ocellatus Ayres, Proc Palif. Acad. Nat. Sci., 1, 1855: 31, San Francisco. (*A. felis* Girard no description, therefore *nomen nudum*): Jordan and Gilbert 1881f, 1882; Jordan and Jouy 1882; Bean, T. H. 1884; Goode 1884; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Gill 1911: Kincaid 1919; Schultz 1930a.
RANGE: Alaska to Monterey (Gill 1911). Marine. Common. No commercial value.
RECORDS: Puget Sound Region: Jordan and Gilbert 1881f, 1882; Jordan and Jouy 1882; Goode 1884; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Kincaid 1919; Schultz 1930a. Hoods Canal near Holly* and Potlatch*. Pt. Townsend—Bean, T. H. 1884. San Juan Is.*.
Coast of Washington: Neah Bay—Jordan and Jouy 1882.
Coast of Oregon: Haystack Rk. near Pacific City*. Port Orford*.

Family 82. SCYTALINIDAE Burrowing blenny

333. (2811). SCYTALINA CERDALE Jordan and Gilbert. Burrowing blenny.
Scytalina cerdale Jordan and Gilbert, Proc. U. S. Nat. Mus., 3, 1880 (1881c): 267, Waadda Island, Neah Bay: 1881f, 1882; Jordan and Jouy 1882; Kincaid 1919; Hubbs 1927; Schultz 1930a.
Scytaliscus Jordan and Gilbert 1884. *Scytaliscus cerdale:* Goode 1884: Eigenmann and Eigenmann 1892.
RANGES Aleutian Islands to Monterey County, California. Marine. Not common. No commercial value.
RECORDS: Puget Sound Region: Eigenmann and Eigenmann 1892. San Juan Is.*—Schultz 1930a.
Coast of Washington: Waadda Is., Neah Bay—Jordan and Gilbert 1881c, 1881f, 1882; Jordan and Jouy 1882; Goode 1884; Kincaid 1919; Hubbs 1927.

Family 83. ZOARCIDAE Eel pouts

334. (2814). EMBRYX CROTALINUS (Gilbert).
Lycodopsis crotalinus Gilbert, Proc. U. S. Nat. Mus., 13, 1890: 105, off Santa Barbara Is. at *Albatross* Station 2980 in 603 fathoms.
Embryx crotalinus: Jordan, Evermann and Clark 1930.
RANGE: Northern Pacific and off Santa Barbara Islands (Jordan, Evermann and Clark 1930). Marine. Rare. No commercial value.
RECORDS: This species has not been recorded from Washington and Oregon.

335. (2815). LYCODOPSIS PACIFICUS (Collett).
Lycodes (*Lycodopsis*) *pacificus* Collett, Proc. Zool. Soc. London, 1879; 381, said to be from Japan; presumably an error.
Lycodopsis pacificus: Jordan and Gilbert 1881f, 1882; Jordan and Jouy 1882; Eigenmann and Eigenmann 1892; Evermann and Goldsborough 1907; Starks 1911; Kincaid 1919.

RANGE: Central Alaska to Central California. Marine. Common. No commercial value.

RECORDS: Puget Sound Region*: Jordan and Gilbert 1881f, 1882; Eigenmann and Eigenmann 1892; Kincaid 1919. Seattle*, Admiralty Inlet (*Albatross* Station 4219), and Port Townsend (*Albatross* Station 4214)—Evermann and Goldsborough 1907. Off Everett*. Saratoga Passage*. San Juan Islands*—Starks 1911.
Coast of Washington: Cape Flattery—Jordan and Jouy 1882.

336. (—). LYCODES JORDANI Evermann and Goldsborough.
Lycodes jordani Evermann and Goldsborough, Bull. U. S. Bur. Fish., 26, 1906 (1907): 343, fig. 120, *Albatross* Station 3788 Northern California and 4267 in Southeastern Alaska.

RANGE: Southeastern Alaska and northern California. Marine. Rare. No commercial value.

RECORDS: We cannot verify the Puget Sound record by Jordan, Evermann and Clark 1930.

337. (2826). LYCODES PALEARIS Gilbert.
Lycodes palearis Gilbert, Rept. U. S. Fish Comm., 19, 1893: 454, Bristol Bay, Alaska: Starks 1911; Kincaid 1919.

RANGE: Alaska to Puget Sound. Marine. Not common. No commercial value.

RECORDS: Puget Sound Region: Kincaid 1919. San Juan Islands*—Starks 1911.

338. (2827). LYCODES BREVIPES Bean.
Lycodes brevipes Bean, Proc. U. S. Nat. Mus., 13, 1890: 38, between Unga and Nagai Islands in 110 fathoms: Gilbert and Thompson 1905; Evermann and Goldsborough 1907; Starks 1911; Kincaid 1919.

RANGE: Aleutian Islands to Puget Sound. Marine. Not rare. No commercial value.

RECORDS: Puget Sound Region: Admiralty Inlet (*Albatross* Station 4218)—Evermann and Goldsborough 1907; Kincaid 1919. San Juan Islands*—Starks 1911. East Sound—Gilbert and Thompson 1905.

339. (2835). FURCIMANUS DIAPTERUS (Gilbert).
Lycodes diapterus Gilbert, Proc. U. S. Nat. Mus., 14, 1891 (1892): 564, off coast of California and Oregon at *Albatross* Stations 2892, 2896, 3067, and 3077 in 82 to 376 fathoms.
Furcimanus diapterus: Chapman and DeLacy 1933.

RANGE: Unalaska (Evermann and Goldsborough 1907) to California. Marine. Rare. No commercial value.

RECORDS: Puget Sound Region: Elliott Bay*. Saratoga Passage*. Off Tulalip*. Near Gedney Is.*—Chapman and DeLacy 1933.
Coast of Oregon: *Albatross* Station 3067—Gilbert 1892.

340. (2839, part). LYCOGRAMMA BRUNNEA (Bean).
Maynea brunnea Bean, Proc. U. S. Nat. Mus., 13, 1890: 38, off Queen Charlotte Islands in 876 fathoms.
Lycogramma brunnea: Jordan, Evermann and Clark 1930.

RANGE: Alaska to California (Jordan, Evermann and Clark 1930). Marine. Not common. No commercial value.

RECORDS: This species has not been recorded in Washington or Oregon.

341. (2839). BOTHROCARA MOLLIS Bean.
Bothrocara mollis Bean, Proc. U. S. Nat. Mus., 13, 1890: 39, off Queen Charlotte Is. in 876 fathoms.

RANGE: Queen Charlotte Islands and southern California. Marine. No commercial value.

RECORDS: This species has not been recorded in Washington or Oregon.

342. (—). BOTHROCARA REMIGERA Gilbert.
Bothrocara remigera Gilbert, Proc. U. S. Nat. Mus., 48, 1915: 166, pl. 20, fig. 19, Monterey Bay in 718 to 756 fathoms: Hubbs 1928.

RANGE: Washington (Hubbs 1928) to San Diego, California. Marine. No commercial value.

RECORDS: Coast of Washington: *Albatross* Station 3075—Gilbert 1915.

343. (2864). LYCODAPUS FIERASFER Gilbert.
Lycodapus fierasfer Gilbert, Proc. U. S. Nat. Mus., 13, 1890 (1891): 108, off Lower Calif. and Washington at *Albatross* Stations 2980, 3010, and 3072 in 610 to 1005 fathoms.

RANGE: Southeastern Alaska to Gulf of California (Starks and Morris 1907). Marine. Not common. No commercial value.

RECORDS: Coast of Washington: *Albatross* Station 3072—Gilbert 1891.

Family 84. BROTULIDAE Brotuloid fishes

344. (2873). BROSMOPHYCIS MARGINATUS (Ayres).
Brosmius marginatus Ayres, Proc. Calif. Acad. Nat. Sci., 1, 1854: 13, San Francisco Bay.
Brosmophycis marginatus: Gilbert and Thompson 1905; Kincaid 1919; Jordan, Evermann and Clark 1930.

RANGE: Petersburg*, Alaska to San Pedro, Calif. (Jordan, Evermann and Clark 1930). Marine. Not rare. No commercial value.

RECORDS: Puget Sound Region*: Gilbert and Thompson 1905; Kincaid, 1919. Elliott Bay*. Hoods Canal near Holly*. Off Everett*. Gedney Island*. Possession Sound*.

Family 85. BATRACHOIDIDAE

345. (2654). PORICHTHYS NOTATUS Girard. Singing fish. Midshipman.
Porichthys notatus Girard, Proc. Acad. Nat. Sci., Phila., 7, 1854: 141, San Francisco: 1858; Jordan and Starks 1895; Greene 1899; Evermann and Goldsborough 1907; Starks 1911; Kincaid 1919.
Porichthys margaritatus: Eigenmann and Eigenmann 1892. *Porichthys porosissimus:* Jordan and Gilbert 1881f, 1882; Jordan and Jouy 1882.

RANGE: Sitka, Alaska, to Gulf of California (Starks and Morris 1907); (Panama? Greene 1899). Marine. Common. No commercial value.

RECORDS: Puget Sound Region*: Jordan and Gilbert 1881f, 1882; Jordan and Jouy 1882; Eigenmann and Eigenmann 1892; Jordan and Starks 1895; Kincaid 1919. Ft. Steilacoom—Girard 1858. *Albatross* Station 4218—Evermann and Goldsborough 1907. Gedney Island*. Saratoga Passage*. Possession Sound*. Hoods Canal near Holly*. San Juan Islands*—Starks 1911.

(To be continued through all issues in 1936)

Educational Facilities of Southern California

By R. B. von KLEINSMID, A.M., Sc.D., J.D., Ph. et Litt.D., LL.D.
President, the University of Southern California
Chancellor, Los Angeles University of International Relations

EMERSON once said, "The best political economy is the care and culture of men." To our universities, colleges, libraries, research laboratories and museums is given the responsibility for the progressive study of peoples and their problems. Because of its geographical location and population, southern California is strategically situated for the study and co-ordination of the history, culture, political science and relationships of those countries and colonies comprising the Pacific littoral. Southern California's educational institutions have not only kept pace with the highest developments in the theory and practice of education the world over, but also have in many respects advanced standards and explored new realms of academic service.

Here are located unusual facilities for scientific and cultural education. Centralized in the area south of the Tehachapi, the agencies of formal education and the depositories of cultural, historical, and scientific information are cooperating to the utmost degree. For example, is it not inspiring to the student of English Language and Literature who is specializing in the Elizabethan period to have the opportunity to study the original Shakespeare Folio printed in London in 1623 and now in the Huntington Library? How can the student of Fine Arts find greater realization of the immortality of great painting than in studying the technique of the masters whose canvases hang in the Huntington Art Gallery? The representative works of Sir Joshua Reynolds, Thomas Gainsborough, and George Romney and other world renowned artists. These include the famous Blue Boy, the Reynolds portrait of Mrs. Siddons as the Tragic Muse and the Portrait of Penelope Lee Acton, by Romney.

In the field of science, the amazing work of Dr. R. A. Millikan has brought the Nobel Prize to southern California. To study and experiment in the research laboratories with the scientists whose discoveries have reached the far ends of the earth is the privilege of the students of the California Institute of Technology. Maintained by the City of Los Angeles, the Griffith Observatory and Planetarium affords opportunity for students of astronomy to learn from actual observation, in addition to attending the lectures given by widely-recognized astronomers. There the scholars of the infinite dissect the heavens, spread the stars upon a domed ceiling, and chart their courses in order that night might be robbed of its terror and man and the universe made friends. Close by are the La Brea Pits, one of the richest treasure vaults of prehistoric life ever found in one locality. One of the pits is open and shows the partially embedded bones as they were first uncovered. The exhibitions of the different forms of animal life from the pits are maintained in the Los Angeles Museum of History, Science, and Art, adjoining the campus of the University of Southern California. The exhibits include mounted skeletons of the imperial elephant, mastodon, ground-sloth, saber-toothed tiger,

DR. VON KLEINSMID

So this is Los Angeles! Well, no—only a segment. Looking northward the view comprises, foreground to foot of low hill in right middle distance, part of the downtown business district. To cover all there was of Los Angeles, business and residential, in the late Seventies, lay a dollar on the picture, extreme right just under tip of the low hill. Cresting the hill a dark, hook-shaped form is forest in Griffith Park. In line with it, extreme left, Hollywood buzzes at the base of the foothills and, roughly midway between, are the now famous La Brea fossil beds (see illustration, p. 146)**. Center distance, at the foot of the mountain range backdrop, lies Glendale, transcontinental airways terminus at the mouth of San Fernando Valley.** — Spence Air Photo.

camel, cave-bear and numerous other prehistoric animals.

The University of Southern California, California Institute of Technology, the Claremont Colleges, the University of California at Los Angeles, Mount St. Mary's College, Occidental College, Loyola University, La Verne College, University of Redlands, Whittier College, Chapman College, and Immaculate Heart College, all of which are in or near Los Angeles, form an enviable group of institutions of higher education. Within their halls may be studied the academic subjects included in the curricula of the Colleges of Letters, Arts, and Sciences, and extensive professional courses in the Schools and Colleges of Law, Music, Medicine, Theology, Education, Engineering, Dentistry, Pharmacy, Commerce and Business Administration, Architecture and Fine Arts, Government, Social Welfare, Philosophy, Journalism, and Merchandising.

In the city of Los Angeles, largest in population and area of the cities of the Pacific slope, research laboratories, great hospitals, and clinics afford the student of medicine unlimited opportunity for advanced and highly specialized study. The municipal, superior, appellate, and Federal courts sitting in Los Angeles offer the law student ample opportunity to hear cases prepared by eminent members of the bar and to study the decisions of the jurists. For students of music there is the regular Philharmonic season of symphony music. Opera companies, and concert artists do their part in bringing the musical heritage of the race to Los Angeles. The Hollywood Bowl with its famous "Symphony Under the Stars" presents the Los Angeles Symphony Orchestra under the direction of noted guest conductors four nights each week during the summer season. The Los Angeles Oratorio Society, the A Cappella choir, and the Civic Chorus present frequent vocal concerts, in which many students participate.

Registrations in the schools of education are increasing rapidly. Facilities for advanced training in professional courses are bringing increasing numbers of students to the metropolitan centers for advanced degrees and credentials. Accessible means for surveys, tests and measurements, and statistical research aid the scholar immeasurably in the preparation of theses, dissertations, and papers for publication. Experimental projects are numerous. The latest developments in teaching-learning activities are examined, and the highly specialized professional courses are undertaking actual laboratory tests in elementary, secondary, and collegiate classroom methods.

Commerce and business administration students find cooperating agencies in the actual commercial world. The Los Angeles Harbor brings the students of foreign trade in contact with distant ports and varied merchandise. Chambers of Commerce, credit associations, and transportation organizations present their latest procedures in order that the business leaders of tomorrow might profit by their experience.

In the movement toward a new American art and architecture, southern California is destined to hold a distinctive place. The movement will be a vital expression of the essentials of present-day life and a necessary consequence of the rapid development of modern technology and processes of construction, but will retain the rich heritage of the past as a general inspiration rather than as a system of outworn conventions to be revered and imitated. Already California has a distinctive type of home architecture peculiarly characteristic of the regional and climatic requirements, and reminiscent of the best features of the Spanish period in our history. Great public and memorial buildings whose designs stay closer to the classical, offer the student of architecture unlimited opportunity for the study of design. Here the young artist finds the inspiration of a community rich in natural beauty. Towering snow clad mountains, withering deserts, palm gardens, orange groves, and the blue Pacific coast line offer a contrasting back drop to the urban industrial civilization of the metropolitan area.

When the exigencies of the recent depression with its consequent unemployment problem required the mobilization of a vast force of workers trained in the technique of social welfare administration, the city universities sup-

plied the needs of the work and relief organizations with their alumni who had studied in the schools of social work. The southern California agencies cooperated to the fullest extent in offering sociologists and practical experience of field work under their supervision. Being the center of a rapidly developing and expanding territory, Los Angeles is confronted with a large quota of social problems. The city presents to the students many opportunities to study social problems and to gain experience in the various welfare agencies in preparation for careers in social work.

Religion ranks as one of the major interests of mankind. Interwoven with every phase of human development, it runs down through the entire course of human history. Situated on the shores of the Pacific, facing the countries of the Far East with their ever-changing problems, southern California has an ideal place for the study of this subject which is basic in all artistic and cultural interests of men. Usually the student of religion must make weary pilgrimages to far off shrines. In Los Angeles, however, many world religions have churches and groups of worshipers. Schools of religion stand ready to aid the scholar in his understanding of the many approaches to the infinite God.

With five daily newspapers and over 150 other periodicals published in Los Angeles alone, southern California presents a fertile field for the student of journalism to supplement his academic and professional studies with work and study in the actual field of newsgathering, writing and editing. In our own university the classroom work is amplified by field trips. Groups of students are organized and sent to about fifteen small cities in southern California where they produce a complete issue of the newspaper. The students gather the news, write the editorials and the feature stories, plan the make-up, and produce the entire issue of the newspaper. Additional conducted trips are made for the purpose of studying matters of circulation, advertising and other journalistic problems.

We of the Pacific Coast have great admiration for our Pan-American, Polynesian, Oriental and Colonial neighbors. Strengthening this friendship and contributing to the understanding of world affairs, is the Los Angeles University of International Relations. Activities in training for foreign service and international understanding include visiting and exchange professorships and scholarships, supervised study in foreign lands, the Interparliamentary Union and the World Affairs Institute to which the International Relations students are admitted. One feature that has proved most successful in the promotion of international good will is the establishment of the Academies of National Culture. The series of Academies furnish opportunities for the commingling of American-born citizens and those of alien birth to discuss problems of na-

Doheny Junior Memorial Library of the University of Southern California and, opposite page, Los Angeles Museum's exhibit of complete skeletons and miscellaneous spare parts of prehistoric animals once lively residents of Hollywood and vicinity who failed to get away in time from wild parties at the tar pits of La Brea. Left foreground appears a restored sabre-tooth tiger, public enemy No. 1 of his day and, center, the frame of an elephant alongside which Jumbo would look like a rat. Discovery of this rich fossil bed opened a new, amazing, so far unmatched, page in natural history.

tional or racial importance, to present programs illustrative of cultural achievement, and to acquaint each other with the contributions to present-day civilization made by the various peoples of the world. Here the student discovers for himself that everywhere the human heart is human.

The speech arts are fortunate in the centralization of motion picture production in southern California. Great actors and actresses appear from time to time on the legitimate stage. The Shakespearean players from London, the justly famed company from the Abbey Theater in Ireland, Max Rinehart and his spectacular productions, the community playhouses, and well-known lecturers and orators all contribute to the education of the student who is looking toward the stage or the platform as his future.

Placing the field of politics and governmental administration among the professions, classes of university grade are scheduled in the training of students for the administration of public offices.

And so it is in the training of pharmacists, philosophers, and engineers of all types—electrical engineers, civil engineers, chemical engineers, mechanical engineers, mining engineers, and petroleum engineers. Professional courses, intensive study, specialization—but not premature specialization—these are the privileges of those who study and work in the universities close to the metropolitan centers of population, such as the southern California area. Specalization implies thorough knowledge, and thorough knowledge is the definition of culture, and the beginning of wisdom. A beloved educator of California, David Starr Jordan, first president of Stanford University, once said:

"Thoroughness is the main point, after all, and should take precedence over versatility. I do not mean to be understood as advocating narrowness of sympathy or narrowness of culture of any sort. The broadest education is none too broad for him who aspires to lead in any part of the world of thought. But the forces of the mind, to continue the figure, should not be scattered in guerrilla bands, but should be marshalled toward leadership."

Here in southern California man and nature have cooperated to create a unique scientific and cultural laboratory. Kipling once said that "East is East and West is West," but here on the edge of the great Pacific area they have really met, and as any one who knows the world might expect, they are finding that they have much more in common than they previously realized. Out here in the land freed from tradition, and yet in a position to profit by it, points of view are placed side by side, new ideas developed and new dreams created; dreams of the civilization and of the world that is yet to come.

Commonwealth Club of California Gets Action

Condensed from notes contributed
By STUART RICHARDSON WARD
Secretary, Commonwealth Club of California

LAST FEBRUARY 3, the Commonwealth Club of California celebrated its thirty-second birthday. Founded in 1903 by Edward F. Adams, editorial writer for the *San Francisco Chronicle,* previously a farmer active in Grange work, the Club has today more than 3000 members, distributes its publications not only to members but to subscribers scattered over the nation. Its reports form a shelf of bound volumes exceeding six feet.

Aptly epitomising its methods of procedure, the Commonwealth Club of California has for its motto Get the Facts, and for the keynote of its work the axiom that there are at least two sides to every public problem. The Club has persistently adhered to the principle that both sides must be accorded full and fair hearings before any opinion may be formed by either a study section or the Club at large.

More than 30 of the Club's study groups meet year in and year out, usually twice a month at luncheon, to hear the best informed friends and foes of pending proposals present their cases. After the evidence is all in, a post card vote of the section's membership is taken and its opinions and recommendations presented to one of the Club's monthly dinner meetings open to every Club member. The group or "Section" which presents its findings and conclusions is held rigidly accountable for having a qualified speaker advocate before that same dinner meeting the viewpoint opposed to its own.

That the original seed which founded the Club—the idea that our American public will in time be guided by recommendations arrived at by thorough and painstaking study in a search for the truth—is a valid one is indicated by the progressive legislation the Club has to its credit:

A state budget law which ended "log rolling" in the state Legislature was drafted, financed, and enacted by the club by means of an initiative proposal.

The institution of the small claims court which makes it possible for people in moderate circumstances to recover amounts of less than fifty dollars without hiring an attorney and other expensive legal procedure.

The addition of the office of Public Defender to the personnel of the courts in California's larger cities.

The State Judicial Council which has unified all the courts of the State and greatly reduced delay in deciding cases.

The removal of the professional juror from the juries of the State.

The forbidding of reversal of court decisions on purely technical grounds when there has been no miscarriage of justice.

Substitution of Civil Service in place of the state spoils system.

The direct primary law.

Nomination of candidates for public office by sponsors instead of nominations by meaningless petitions.

These and many other improvements for the public good were originated, drafted, and pushed through to adoption by the Commonwealth Club of California.

Every Friday noon in the Palace Hotel, San Francisco, the Club has held a luncheon without a break since 1908, heard more than a thousand distinguished speakers from every country in the world. Every President of the United States since McKinley has addressed its membership. Attendance at the luncheons runs from 300 to 1800, depending upon the speaker and the timeliness of his subject.

In these times of widespread interest in public affairs the Commonwealth Club of California finds its dockets full and running over with problems of all sorts.

Pan-Pacifica to Discuss Problems

By FREDERICK SIMPICH, JR.

REPRESENTATIVES of eleven Pacific countries will gather at the Yosemite National Park in August of this year to convene the sixth conference of the Institute of Pacific Relations. There business men, educators, newspapermen and lawyers from the regions that border the Pacific will devote two weeks to discussions based on an agenda which offers some 175 pressing questions—each of vital importance to proper understanding of the problems of the Pacific.

Institute conferences seek not so much solution as understanding. No resolutions are passed or action urged. Instead, at the close of the conference the representatives go their way, each to his own country armed with a better understanding of the circumstances and problems of his neighboring states.

Discussions during the conference are organized by round tables and, though informal, are guided by a discussion leader, usually an authority on the general topic under consideration. Institute conferences cover such a wide range of topics that no group of men can be expected to have authoritative knowledge of the facts of each problem. So, in the periods between conferences, usually two or three years, the Secretariat conducts extensive researches in fields where misunderstanding lies. The facts so developed are presented at the conference in the form of data papers and provide the factual basis for round table discussions.

Just as countries assiduously avoid sending to the conference representatives who hold official positions which would interfere with a free expression of opinion, so those who prepare the agenda consider no topic too dangerous, no problem too delicate for exhaustive consideration.

Representatives this year, numbering 200 or more with their retinue, will deliberate on five major topics. they are:

1. United States Recovery Program and Its Repercussions in the Pacific.
2. Japanese Economic Expansion in World Markets.
3. Economic Development and Nationality Policy of the Soviet Union.
4. Economic and Social Reconstruction in China.
5. The Changing Balance of Political Forces in the Pacific.

It would be possible to spend two weeks discussing these topics without treading on toes. Words could be minced and the disputed aspects avoided. But that would not do for the men who attend these conferences. Level-headed industrialists whose profits are involved in international relations, newspapermen who must know the real significance of everyday events —they are interested mainly in the difficulties, not the simplicities of Pacific affairs.

What then are the questions these men will consider? The agenda for the forthcoming conference contemplates discussion of about 175 problems. The following extracts drawn at random from this document are typical:

What has been the effect of the American Silver Purchase program on the financial situation in China?

What is likely to be the policy of the United States with regard to Japan's program for controlling the China market in her own interest?

How far is Japanese economic expansion part of a considered program on the part of the Japanese government?

To what extent and in what markets is there evidence of dumping of Japanese goods or of "social dumping"?

Was the yen depreciated deliberately as a means of permitting exports and of checking the internal deflation of Japanese prices, or was the depreciation forced upon Japan by the depreciation of the pound sterling and by the inadequacy of Japan's gold reserves?

To what extent is the Japanese government likely to exert diplomatic or military pressure in order to secure tariff reductions and other commercial concessions in China to the direct disadvantage of other foreign interests?

How close has the Soviet Union come to self-sufficiency? Is this the natural result of richness of natural resources? Does it represent a short-term objective determined by external conditions? (Consider here political and financial isolation and also the general curtailment of world trade.)

How far can Japan regard the further development of a fully industrialized and militarized

U.S.S.R., including the Far Eastern District, as a revival of the old Russian threat to her territory and interests?

How far could Japan obtain her economic demands, *e.g.* for raw cotton, without the necessity for military action in North China? Could the profits of Japanese business in China under Japanese protectorate be large enough to compensate for the high costs of maintaining Japanese troops in China?

What American policy toward the Philippines would do most to relieve potential sources of international friction?

Once such matters as these are introduced, it will not be long until conference members have heard every side of the question!

Australia, Canada, China, Great Britain, Japan, the Netherlands and Netherlands Indies, New Zealand, the Philippines, the Soviet Union and the United States will be represented at Yosemite, so many of these problems will evoke three and four conflicting views. Yet their frank and informal discussion, by leaders of the various member countries will, as in preceding conferences, lay the ground work for mutual understanding. No propaganda will be broadcast, no verbatim record of the discussions will be made, but one feels that the cause of understanding will advance with every day spent in informed discussion of differences.

Women of the Pacific for Peace

NEXT YEAR, in Canada or Japan, date and place not yet set, will be held the Fourth Pan-Pacific Women's Conference (First, 1928; Second, 1930; Third, 1934—all held in Hawaii, at Honolulu). Dominant subject for expected discussion next year; Peace in the Pacific.

Reviewing in *Liberty*, April 11, 1936, the Third (1934) Conference Mrs. Emily Newell Blair, who attended the conference, says:

"Important women, those delegates! In the American delegation, for example, were the then president of the General Federation of Women's Clubs, Mrs. Grace Morrison Poole, and two of its vice-presidents, Mrs. E. B. Lawson and Dr. Josephine Pierce.

"Certainly there existed no racial antagonisms at this conference, such as one finds in other parts of the world. At the dinner which opened it, on my left sat a Caucasian New Zealander; on my right a dark-skinned East Indian; across from me a beige Filipino; beyond her a cream-colored Maori; next to her, a slightly darker Hawaiian. A Korean was between a Chinese and a Japanese. Americans and Canadians and Australians were sprinkled liberally among them.

"Perhaps it may be easier for women to impress their ideas and ideals in the Pacific than it was in the Atlantic. For one thing, in most of the Pacific countries women have the vote. In some of them they have had it longer than in the United States. In New Zealand and Australia they have had it so long that women take an active and influential part in public affairs as a matter of course. In China and India they have not had it so long, but the fact that they won it simultaneously with men made for an equal participation in public affairs. Even in Japan women now raise their voices in public. Therefore, once these women of the Pacific agree on how to build a more harmonious world there, they have the political means at hand to do it."

En route home to Australia from the League of Nations Assembly Mrs. Bessie M. Rischbieth, center, an officer of the Pan-Pacific Women's Association, greeted at Honolulu by, right, Miss Alice C. Brown, Treasurer, and Miss Ann Y. Satterthwaite, Honorary Secretary.

Haiku Poetry of Japan; an Appreciation

By JOHN WRIGHT BUCKHAM

Berkeley, California, Pacific School of Religion

WHATEVER form of art recovers and perpetuates the spirit of childhood wins, and deserves, the gratitude of all men. Very beautiful is chidhood itself, at its best and truest, in its wonderment, its trustfulness and its joyousness. Yet the child is but partially conscious of both its freedom and its limitations. It knows not the inner meaning and felicity of its own spirit. It is only as childhood is recaptured, held fast in the bonds of the spiritual reason and will, and lifted into the disciplined experience of art, that its full meaning can be recovered and realized.

When one thinks of so rare an achievement as this there comes to mind such contrasted instances of it as Canton china, the paintings of Giotto and Fra Angelico, the Chorals of Bach, the poems and pictures of William Blake, and the child songs of Francis Thompson. With gratitude and joy a jaded and despoiled world accepts and cherishes such adventures backward—or should we say forward—into the Elysium of pure childhood.

A fresh discovery of the spirit of childhood embodied in a form of pure and pleasing art, little known in the Occident, has come to my attention in the *Haiku* Poetry of Japan described and exemplified in the volume by Professor Asataro Miyamori entitled An Anthology of Haiku Ancient and Modern.[1] This golden galleon from the Pure Land of Recovered Childhood contains over a thousand poems of this School, with an introduction, translations and annotations, and a large number of exquisite prints illustrative of the poems.

Haiku poetry consists formally of three lines, containing seventeen syllables, wholly without meter or rhyme, but having that indefinable quality, best named rhythm, which constitutes the essence of poetry. The genius of Haiku is to call before the imagination "only the focus of a momentary impression of the scene hinted at" but thereby to suggest boundless contexts of beauty and meaning. For translation into English the couplet seems to be the natural counterpart.[2] Professor Miyamori writes of Haiku:

> "It is composed, throughout the empire, by people of all stations in life, men and women, young and old. Lafcadio Hearn's remark applies with special significance to the case of haiku:—'Poetry in Japan is universal as the air. It is felt by everybody. It is read by everybody. It is composed by almost everybody—irrespective of class and condition.' In this sense the Japanese people may well be called a nation of poets and poetesses."

This could hardly be said of Americans, yet the universal love of poetry which makes all the world akin, should form a tie between these two peoples.

The chief founder of the School, Jinschichiro, whose *nom de plume* was Basho, was born in the year 1644 in the province of Iga. After studying literary forms for several years, he began writing, while living upon the bank of a river in a hut of one room which came to be known as "the Banana Hermitage". Here he familiarized himself with the teachings of the Zen sect of Buddhism, which undoubtedly influenced his views of life and nature. The hut was burned, the poet narrowly escaping, but was rebuilt by his pupils and friends.

At the age of forty Basho set forth, accompanied by his pupil Chiri, on the first of a series of poetic pilgrimages, equipped as follows: "He wore a large basketwork hat, paper clothes and a light-brown cotton coat, with a scrip round his neck, carrying in hand a walking stick and a rosary of one hundred and eight beads; the scrip contained two or three anthologies, Chinese and Japanese, a flute and a tiny wooden gong. In a word, he looked like a Buddhist pilgrim." In this and later tours

[1] Tokyo, Maruzen Co., Ltd., 1932.

[2] One feels that Haiku is so closely attached to the genius of the Japanese language that translation is peculiarly powerless to convey all of its flavor and meaning.

wherever he stopped the *haikai* writers came to visit him and to hold "poetry parties," many becoming his pupils. Death came to him with untimely precipitancy on one of his pilgrimages. The poet greeted it with the following heroic and submissive but sorrow-stricken lines:

Tabi ni yande
Yume wa kareno wo
Kakemeguru

which may be rendered from Mr. Miyamori's translation:

The traveller is arrested on his way,
And his dreams roam o'er withered moors.

A note of sadness runs, like the song of the beloved nightingale, through Basho's poetry.

None goes along this way
But I, this autumn eve.
Ah! summer grasses wave!
The warriors' brave deeds were a dream.

Yet sorrow is mingled in his verses with a quiet joy and always there is a rare sensitiveness to truth and beauty. His verses "are, for the most part, objective descriptions pregnant with delicate subjective feelings." His life, devoted to poetry, was fruitful in inspiring many other poets through succeeding years.

Next to Basho Professor Miyamori ranks Buson, born in 1716, an artist as well as poet, another son of poverty but having periods of great domestic happiness and inner content.

Third of the leaders of the School was Issa, born in 1763. His life, too, was one of constant sorrow and trouble, yet he was not overcome thereby. Out of his grief at the loss of one of his little boys, dying at an early age, came this touching threnody:

Life is a morning dew;
'Tis true, but well-a-day![3]

Fourth of the poets whose lives are sketched by Professor Miyamori was Shiki, born in 1867 at Matsuyama. For many years he conducted a Haiku column in the newspaper *Nippon*. He was the author also of several works of fiction.

Besides these formative poets, numberless others have composed Haiku verse, continuing to the present time, a selection from whose verses Professor Miyamori has brought together in his compendious collection. As one wanders, like a happy pilgrim, through the ever-changing beauty of this land of verse, certain characteristic qualities emerge which I have tried to denote in the following analytical study.

A note that runs with never-failing music through these mystical poems is that of a pure nature affection, sincere and full of deep insight, a gentle intimacy of understanding of nature of the finest kind. One finds it in such verses as these:

A bird as my companion,
I walked on the withered moor.
SENNA.

Through the tempest blowing the shingles
From my roof, I heard insects' voices.
RIYU.

A hesitation to injure any living thing, even a flower or plant, appears often, as in these lovely lines by the poetess Chiyo-Ni:

A morning-glory having entwined
The well-bucket, I go to beg water.

— — —

Do not tread on the grasses there,
Where fireflies glowed last night.

exclaims Issa.

Pervading all the references to nature there is a rare delicacy of discernment of beauty which the careless eye fails to observe. Basho, *e.g.*, notes:

The lespedeza flowers swaying, swaying,
But not enough to shake down their crystal dews.

Wind in the willow is thus described by Saryu:

The willow paints the wind,
Without using a brush.

Early passing of the morning dew awakens this comment from Tsuyu Chiru:

The morning dew melts willingly,
As if it scorned this impure world.

The grateful mind of the poet feels in nature a kindly benevolence; as when Basho, regarding with compassion and sympathy an aged village, notes with pleasure:

The village is so old, there is
No house but has persimmon trees.

In no land is the uniting bond born of the enjoyment of natural beauty so felt as in Japan. Nature binds together in one those who share her beneficence. Issa has happily expressed this as follows:

Under cherry-flowers
None are utter strangers.

[3] Perhaps this might be rendered:
Life is like morning dew,
Fair, yet how full of rue!

Basho, listening to a cuckoo, would fain believe that the apparently indifferent tea-pickers are listening also.

It may be that, hidden in the shade of the trees,
Tea-pickers too are listening to the cuckoo.

A parallel of the Scottish proverb "Ilka blade o' grass has its drap o' dew" may be found in these lines of his:

Quite unknown to the passers-by—
The chestnuts flower beside your house.

Issa, beholding some aged folk enjoying the evening air, reflects:

Unaware 'tis their life's curfew,
They enjoy the cool of evening.

Yet there is always danger that one, all of whose days are occupied with beautiful things, may become careless to beauty as Buson warns:

Cultivator of chrysanthemums,
You are a slave to chrysanthemums.

The detection of humble and inconspicuous beauty comes to him who stops to look again, or stoops to pluck the lowly flower.

Taken in the hand,
Still prettier seems the violet!
KOSHU.

The purifying and hallowing influence of nature makes itself felt in conduct and mood.

I looked out over the first snow,
And turned to wash my face.
ETSUJIN.

— — —

Looking at the plum-blossoms,
I regret having lost my temper.

reflects the sensitive spirit of Rosen. One is reminded often of Wordsworth's lines:

With an eye made quiet by the power of harmony
And the deep power of joy, we see into the life of things.

Moonlight seems to appeal to the Japanese music-lover with peculiar charm.

What a bright and beautiful night!
I can hardly believe there is only one moon,

cries the entranced Ryota. Saikaku, having lived two years beyond the allotted age of fifty, exclaims in gratitude:

I have enjoyed the harvest moon
Two extra years, in fleshly life.

Reflected in Haiku poetry is a keen sensitiveness to what may be termed monotones, as also to abrupt contrasts which startle and arouse the meditative mind. The former is illustrated in the famous Haiku by Basho "which took the first step," writes Professor Miyamori, "in the movement elevating the haikai to severe, pure literature."

Lo! a crow perched on a bare branch;
In the dun autumn even.

Sombre crow, bare branch, the dreary autumn nightfall—the picture is complete. Contrasted with this is the still more famous verse ("there is not a Japanese but knows it by heart"):

Furuike ya
Kawazu tobikomu
Mizu no oto

Many translations have been made of this poem. Guided by them (knowing nothing of Japanese) I venture the following:

The ancient pond in silence sleeps;
When splash! a frog disturbs its deeps.

It were impertinent to try to analyze this verse. One feels that the solemn and the ridiculous lie close together in it, as they often do, and should, in life. This sense of contrast appears, in a very different form, in the well-known beautiful verse of Buson:

Poised upon the temple bell
A butterfly is sleeping well.

Opposite this verse in the volume is a charming picture of the bell of a great Buddhist temple with a butterfly perched upon its rim, and Professor Miyamori comments: "This apparently artless little verse may be construed to mean something more . . . some reflection on human life." Basho has this striking picture of war and peace:

Alas! beneath the helmet
A grasshopper is chirruping.[4]

This sense of incongruity takes a playful aspect in such a verse as "The Fan-Pedlar" by Kako.

A load of wind upon his back,
How hot he is—with this strange pack![5]

The scarecrow, oblivious of the presence of the Emperor, amuses Dansui.

The scarecrow does not uncover
Even to His Imperial Majesty!

Swift, revealing flashes of insight into human nature and relations constantly occur, such as this comment upon making the most of what one has in the way of hospitality, by Basho:

In my cottage the mosquitoes are small;
That is the only good cheer I can offer.

— — —

How I enjoyed the evening cool
With one who speaks not all he thinks.

exclaimed the wise Hyakuchi. Sagaciously detecting, like Paul, that "there are many kinds of voices in the world

[4] Instead of "Alas!" why not substitute "Rejoice"?
[5] In this and other verses I have again ventured an altered rendering.

and none of them without signification," Wafu writes:

With different ears, we mortals ken
The insects' songs, and talk of men.

Presented with a maiden-flower by his landlord, the witty Kakei comments:

Since I've no wife, to give me loving care,
My landlord sends me a "maiden-flower" fair.

Full of tenderness is this beautiful poem of the bereaved poetess Chiyo-Ni:

Tombo-tsuri
Kyo wa doko made
Itta yara
How far may he have gone today—
My little dragonfly hunter!

Many a pearl of wise philosophic thought, too, lies hidden in these sea-shells drawn from the deeps of nature and life—none quite so replete with paradox and profundity as this:

In my hut this New Year time, there's nothing;
Which means that in it there is everything.
Sodo.

This recognition of the ingression of the universal into the particular sounds like an anticipation of Whitehead's Principle of Concretion—in the concrete.

If to any sophisticated reader these miniature vignettes signify nothing let him re-enter the Banana hut of Basho, or turn again to the philosophic mind of Sodo, and having caught the vision splendid, fare forth to find beauty and meaning everywhere.

One leaves these poems with something of the reluctance with which Basho pictures a bee withdrawing from a flower:

How reluctantly the bee emerges from
The delightful depths of a peony!

Yet there is more than honey here—wisdom and tranquillity and the heart of childhood clothed in true and living art.

Pan-Pacific Union Affiliates in Japan Active

LARGEST of the many Pan-Pacific Union branches in Japan is the Pan-Pacific Club of Tokyo, which holds regular weekly luncheon meetings where noted speakers from all countries are heard. Among recent speakers was Robert H. Davis—better known to millions of readers as Bob Davis—of the *New York Sun,* most widely traveled correspondent in the world. He spoke on Immortals I Have Met.

Mr. Davis mentioned meeting Prince Hirobumi Ito in America in 1903, writing a page story about him, asking him to read and approve it. The prince said he didn't want to see it—to send it to Tokyo and if the Foreign Office approved it, that was sufficient. Ultimately it was approved, returned, and published.

Mr. Davis spoke of O. Henry (Sydney Porter) with whom he negotiated for newspaper stories at $60 a week in 1903. The managing editor thought this excessive so Bob quit the newspaper, took O. Henry with him into magazine publishing. For 20 years Bob Davis was one of America's great magazine editors, discovered many new writers who have since become world-famous.

Another noted speaker was Miss F. A. Randell, an ardent member of the Pan-Pacific Union, formerly lecturer in mathematics, Municipal Training College, Hull, England, who spoke on The League of Nations and the Present Crisis.

Among other recent foreign speakers the Club has heard Colonel Lapomalede of the *Echo de Paris;* Frank Smothers of *The Chicago Daily News;* Dr. Frank Leavell, of Nashville, Tenn., U.S.A.; Feodor Chaliapin, the singer; Giacinto Auriti, Italian ambassador to Japan; Arthur Male, Honorary Consul of Western Australia for Japan; Melville H. Walker, University of California; Dr. Kyu H. Chyun, Loyola University, Chicago; Gen. Francisco Aguilar, Mexican ambassador to Japan; Miss Claudia Cranston, American novelist; Wilder Hobson, an editor of *Fortune;* Dr. S. S. Nehru, scientist, Indian Civil Service; Miss Gwen Dew, of the *Detroit News;* Manuel A. Alzate, Chairman Committee on Foreign Relations of the Philippine Commonwealth; Prof. Hugh Miller of the University of Southern California. Many residents of Japan, prominent in official and civil life, addressed the Club at various times.

English Favored as Philippine Official Language

By TEODORO R. YANGCO

THE PHILIPPINES, launched in an alluring but perhaps perilous adventure on its way to an independent existence, must concentrate on a common language if unity is to bless the new government. For unity becomes absolutely essential for the upkeep of our government in the midst of the present international scramble for territory and power. For this reason, I advocate the adoption of English as the common language of the Filipinos.

Ever since the implantation of the American sovereignty in this country, public schools were established throughout the archipelago and the Philippine Legislature has continually appropriated a considerable amount of money for maintenance of these schools. American teachers and instructors were employed and books freely distributed throughout for use of school children. The growth of public schools was rapid and to such an extent that even at the remotest village they are found, so that practically all over the islands English becomes widely spoken.

Under such circumstances, it is absurd and improper to promote local dialects. What we ought to do is to forget our dialects and speak the English language. That is what I am trying to do among the Filipino people. The Tagalogs want the Tagalog dialect to be made the common language of the Filipinos; the Visayans want theirs instead, and so with the Pangasinanes, the Bicolanos, the Ilocanos, the Pampangos and others. It is necessary that we have a common medium of expression in order that there may be unity, because without unity we will no doubt fail. That is my conviction and I am sure that most of the Filipinos will agree with me on this point.

On the other hand, the English language is spoken by most progressive countries of the world. We could, therefore, adopt it as the official language of the Filipinos so that we may understand each other, and I am sure the adoption of one common language will bring great progress in our country, and if there is progress there is happiness.

Aside from what I have just mentioned, there are millions of good books written and published in English which can be bought at a low cost and these books are very instructive and helpful to our culture and civilization. So if we know English we have no need to write vernacular books which are very expensive and no doubt there would be few who would buy them on account of the dialect which is only local. I myself, if I know many things which are practical and have helped me very much in my education, they are due to my knowledge of the English language. If I did not know English, I am sure I would not have succeeded not only in my private and public life but also in my social and commercial life.

Pan-Pacific Union Strong in the Philippines

REPORTS from Gregorio Nieva, Secretary of the Pan-Pacific Association of the Philippines, indicate strong and increasing interest in the Pan-Pacific Union and lively appreciation of its growing power as a factor for mutual understanding between peoples of the Pacific area.

Identified with the Pan-Pacific movement in the Philippines, led by President Quezon, are many officials of the Commonwealth and men and women prominent in the professional and business life of the islands.

Indicative of the part its women are playing in advancement of education and community spirit in the Philippines, the Pan-Pacific Union is glad to present two distinguished examples through photographs received from Mr. Nieva.

MISS LOURDES MILA NIEVA

MISS MERCEDES MONTILLA

Miss Mercedes Montilla, daughter of the Hon. Gil Montilla, Speaker of the Philippine House of Representatives, was elected "Miss Philippines" by 2,500,000 votes and crowned Queen of the 1936 Carnival held in Manila February 15 to March 1.

Miss Lourdes Mila Nieva is the daughter of Secretary Nieva. She was elected Inter-Collegiate Girl of the Philippines for 1936 by representatives of seventeen universities and colleges, and Secretary of the Editors' Guild of the Philippines. She is now in her third year in journalism, University of San Tomas. She has visited China and Japan several times and expects to go abroad when she finishes her course in journalism.

Noted Speakers at Shangai Pan-Pacific Meetings

TWO active and growing branches of your Pan-Pacific Union in China, the Pan-Pacific Association of Shanghai and the Pan-Pacific Association of China with clubs in various centers of the vast Republic, report steady progress.

Miss Marguerite Chen, secretary of the Shanghai Association, mentions recent notable speakers including Sir Charles Marston, famous archeologist, vice-chairman of the British School of Archeology in Egypt, member of the Executive Board of the Palestine Exploration Fund and author of several books, who spoke on Recent Excavations in Palestine.

Dr. Dugald C. Jackson, Professor

DR. JAMES N. HENRY

Emeritus of M.I.T., spoke on Recent Industrial Developments in China and the Far East. Dr. O. C. Kiep, Chairman of the Economic Mission, gave a talk on progress in the work of the Mission.

Canton has an especially active branch of the Pan-Pacific Union. Dr. James N. Henry, Dean of Lingnan University, who recently addressed a Friday night science dinner at the Pan-Pacific Union's Research Institution in Honolulu, is a trustee of the Canton branch. En route, he addressed also the Pan-Pacific Club of Tokyo.

Dr. J. H. Liu, Director General of the National Health Administration, Nanking, China, advises that the National Health Administration has appointed three delegates to The Second Congress of the Pan-Pacific Surgical Association to be held in Honolulu next August 6 to 14; they are Dr. H. L. Chang, Associate Professor, Department of Surgery; Dr. G. M. Meng, Associate Professor of Orthopedic Surgery; Dr. J. Hua Liu, Professor Otolaryngology, all of Peiping Union Medical College, Peiping, China.

Other China delegates previously appointed are Dr. Kenelm H. Digby of the University of Hongkong; Dr. P. F. Greene, Chief of the Surgical Division, Hunan-Yale Medical College Changsha; Professor B. Martin, Sun Yatsen University, Canton; Dr. J. B. Todd of Canton.

This gives China the largest single delegation so far from any Pacific Country excepting the United States.

Honolulu Meetings of the Pan-Pacific Union

NOTABLE speakers who have addressed Pan-Pacific Union members and guests at the weekly luncheons held every Monday in Fuller Hall, Honolulu, since March 16 include:

Dr. Daniel Poling, President, International Society of Christian Endeavor, on World Affairs and Youth.

Dr. William Alanson Bryan, Director, Los Angeles Museum of History, Science, and Art, on work of the Los Angeles Museum.

Mrs. Bessie M. Rischbieth, J.P., O.B.E., one of Australia's five government delegates to the League of Nations 16th Assembly, on impressions of the European Situation and Its Social Implications to the Women's Movement. (See illus. p. 150.)

Oren E. Long, Superintendent, Department of Public Instruction, Territory of Hawaii, on Social and Educational Trends.

Stanley C. Kennedy, President, Inter-Island Airways, on The Hawaiian Air Mail Service and Its Value to the Territory.

Eiichi Kiyoka, visiting professor in Oriental Studies, University of Hawaii, from Keio University, on The Work of Keio University, founded by his grandfather, Yukichi Fukuzawa.

Frank E. Midkiff, of the Community Association of Hawaii, on Improving Conditions in Rural Communities, followed by 5-minute speakers representing the Army and Navy and civilian interests.

Felixberto G. Bustos, publicist of

Manila, on The Upbuilding of the Philippines.

In addition to the weekly luncheons, the Pan-Pacific Union holds dinner meetings every Friday evening at the Pan-Pacific Union's Research Institution for discussion of scientific subjects and to hear noted speakers who, since March 6. include:

Otto Degener, B.S., M.S., botanist, University of Hawaii, 1925-27; naturalist, Hawaii National Park, 1929; collaborator in Hawaiian botany for the New York Botanical Gardens; author of Flora Hawaiiensis and Plants of Hawaii National Park.

Miss Margherita Herendeen, on Flying Over South Africa.

Forrest J. Pinkerton, M.D., on The Eye, illustrated.

J. W. Berger, General Secretary Y.M.C.A. of Berkeley, California, on International House.

Dr. Ormond E. Wall, on Angkor Wat, with colored motion pictures of the ruins.

Dr. James M. Henry, Dean of Lingnan University, Canton, on Progress in China. Dean Henry is a director of the Pan-Pacific Union branch at Canton (see illus. p. 157).

Mrs. Bessie M. Rischbieth, J.P., O.B.E., President, Australian Federation of Women Voters, Perth, West Australia, on The League of Nations.

Dr. O. C. Magistad, Director, Hawaii Agricultural Experiment Station, on New Work of the Hawaii Agricultural Experiment Station, including taro, rat extermination, liver fluke, truck crops, poultry diseases, live stock feeding.

John M. Westgate, Professor of Tropical Agriculture, University of Hawaii, on Agriculture in Java and Malaya.

Theodore Rhea, Director, Health Education, Department of Public Instruction; one of three educators sent to Poyer School, American Samoa, through Barstow Foundation last summer, on Life in Samoa, illustrated.

F. G. Bustos, journalist of Manila, on Agriculture and Science in the Philippines.

Dr. Willard H. Eller, Associate Professor of Physics, University of Hawaii, on Radio Activity and Transmutation of Elements, followed by motion pictures of California's winter sports shown by Ray J. Baker. Mr. Baker talked on Some American Industries, illustrated with colored slides.

Max Cutler, M.D., head of Tumor Clinic, Michael Reese Hospital, Chicago, on Control of Cancer, followed by discussion in which representatives of the Army and Navy and the civilian community participated.

Hans Zimmerman, physical culturist, on Technique of Physical Culture Therapy with demonstrations, including a program by the Pan-Pacific Union Students' Club, members of which reside at the Union's Research Institution.

Col. George Bicknell, Hawaii representative of the Pan-American Airways, on Wake Island.

Col. L. H. Stanford, Signal Corps, U.S.A., on Military Communications.

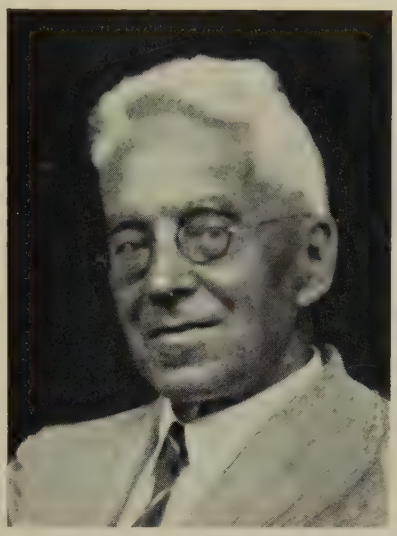
HOWARD KENT BURGESS

THE persons whom you remember the longest, whom you most respect are those who make no compromises, who are true to themselves. My brother, more than any man I ever knew, pursued unswervingly the path his conscience and his duty led him. If there is still such a thing extant as a "New England conscience," Howard had it. Descended from I don't know how many Mayflower ancestors, a half dozen of whom I could name, he inherited the moral sap and fibre of the Puritan character—not its inhibitions, but its rectitude, its sincerity and its sense of responsibility. Honesty with him was as natural as breathing. To induce him to take money he had not earned or which he thought he didn't deserve was impossible. His will was adamant and his honor inflexible. Thoroughness in every least thing he did made his actions as honest as his word. When he said "No," it was useless to argue. When he said "Yes" his loyalty and his generosity went all the way to the end.

Howard was a philosopher; he had

his own plan of life and pursued it regardless of success or failure. There was something of the Stoic in him, something of the fatalist. In his last letter to me he asked about the lines beginning, "Serene, indifferent to fate," etc. I think it was his favorite sentiment. What disappointments and trials and sorrows came to him were borne without lament or self-pity. He sought or wished for no sympathy, he was too strong in himself, too proud ever to seek aid of any man. Life treated him harshly but he never showed it. Few even of those who saw most of him, perhaps, were aware of the talent he possessed in many lines, the blitheness of comedy in which he could excel, his rare, dry humor, his invention, his adaptability to many arts found little opportunity for expression in later years. They were put aside by his splendid power of self-sacrifice. He was without rashness and without timidity. His self-respect and his great sense of proportion gave his character a tone and stability that prevented the possibility of his ever appearing undignified.

It seems strange that one who so delighted in the open air, in the sane life of the country, in physical exercise and spartan diet should not have had his life extended to a longer span. But he died having expressed himself more sincerely than anyone I know in the conditions imposed upon him and the answer he always gave when duty called has, I believe, helped him to progress after those mortal restrictions were removed.



HAROLD KENT BURGESS
(1861-1936)

For seven years a member of Pan-Pacific Union headquarters staff, the last two as Treasurer, Mr. Burgess passed suddenly on April 20. The accompanying appreciation by his brother Gelett Burgess expresses as truly that of all who knew him.

Howard loved Hawaii. It was his real home. I am forever grateful that, after the herculean tasks he set himself and accomplished, but which few besides he himself knew, he could have passed his last years in the beautiful and soothing environment of his adopted country, the Paradise of the Pacific.

—GELETT BURGESS

Books Received

ETHIOPIA, A Pawn in European Diplomacy, By Ernest Work. MacMillan, New York.

This scholarly book is particularly valuable at this time, giving as it does a full account of the relationships of Ethiopia with Egypt and with various European countries during the last 50 years or so. The author was of late educational adviser to the government in Ethiopia; consequently he had access to historical documents, treaties, and material not usually available to foreigners. Here is to be found in detail a description of the efforts and intrigues first of France, then of Italy, also of England, Germany, Russia, and Turkey to obtain a secure footing in Ethiopia, efforts thwarted in each case by the courage and astuteness of the two emperors in these fateful years. France and Italy, however, were both able to secure part of the Eastern littoral, now French and Italian Somaliland. England also obtained a strip of land between these two.

Later, when England had convinced the emperor of her good faith and chief desire, the protection of Egypt, she was given a good slice of Ethiopian land along the eastern and western side of the Nile River whose source head waters lie in Ethiopia. The book clearly shows how vital it is that Egypt should have a powerful protector who is on good terms with Ethiopia. For the Nile waters, flowing down through the Sudan, upper and lower Egypt, alone guarantee to the *Fellaheen* (peasants) the fertilization of their desert lands on which their very life depends. Some unfriendly power dominating Ethiopia and wishful to annex Egypt could threaten to destroy the whole country by cut-

ting off the flow of these waters or by letting them loose to flood and drown it out. Ethiopian native rulers could never do this on account of a solemn covenant they made with Egypt when that country returned "the True Cross" to Ethiopia centuries ago. In return, the Ethiopians solemnly undertook that they "would never thereafter divert the waters of the Nile from Egypt." Commmorating this agreement, the ancient "Festival of the Cross" is religiously observed in Ethiopia each year with great ceremonial.

It was the rivalry of France and Italy to get a strangle hold on Ethiopia and thus on Egypt that made it imperative for England to strengthen her position as protector of Egypt and the Sudan at the end of the last century and also to claim the friendship of Ethiopia. A friendly treaty concluded between England and Ethiopia in 1902 calmed the apprehensions of Egyptians, but the necessity of maintaining the independence and integrity of Ethiopia and her rulers remains just as urgent now as then.

Dr. Work thinks that ever since Italy made her desperate attempt to seize Ethiopia in 1893 and was defeated at the Battle of Adowa, she has been longing for her revenge. Consequently, she has consistently refused to submit her claims and her disputes in "border incidents" to arbitration or of late to the League of Nations, so that she could use them as reasons for a fresh attack on the country.

This unrighteous battering af a weaker nation by a stronger, fully armed one only emphasizes the need in our own day for strengthening our co-operative protection of smaller nations by a strong League of *all Nations*, backed by an International Police Force that can act promptly.

Dr. Work is to be congratulated on having given us a most interesting and timely book, which has also a good bibliography showing the sources of his fine array of facts. This makes it a valuable reference book for educators, historians, and others.

—Mildred Staley.

Why Wars Must Cease, A Symposium, by Ten Eminent Women. Macmillan, New York. $1.

War is Hell, said Sherman. If Hell is a place or state of utter torment, of shattered, flesh-ripped and bone-broken bloody human bodies, desolate countryside, wrecked communities, agonized remnants of families, bankrupt and chaotic nations—then Sherman was right.

In a stunning arraignment of war, the ten authors of Why Wars Must Cease drew upon a vast amount of authentic material to prove that war is Hell, that "war in the modern world is simply a one hundred per cent mistake," that it "can give nothing of the slightest value to any modern nation and lays waste most of what makes life worth living," and that, viewed from any angle, it is obsolete and in practice the ultimate of stupidity.

The roots of war do not necessarily go deep, but they spread widely, and the very number of the tangled rootlets confuse the average person as to the main source of nourishment. Shorn of all the bewildering network of encumbering detail, the fundamental reason for war becomes crystal clear, thinks the group of distinguished writers, and they quote Charles M. Schwab, head of the gigantic Bethlehem Steel Company, whose profits during the World War were staggering, as having put it baldly when he said, "There never was a war that did not spring from commerce, with selfish trade motives at the bottom of it."

Under the stimuli of martial music, frenzied exhortation and cunning propaganda, one man of every seven on earth between 1914 and 1918 donned a uniform, shouldered a rifle, practiced the art of killing his fellowmen, and marched off to test his skill at shooting them down, ripping them with old steel, blowing them apart, drowing them or poisoning them.

Thirteen million men, or one in every four composing those armies, were killed, a statistician asserts. Another twenty million suffered the agony of wounds. Tens of millions of "the people at home" wasted away and died from causes directly traceable to that "glorious" World War, one of the authors declares.

The heartbreak, the physical and mental suffering, the demoralization and terrific economic losses developing out of that conflict were so great, and so horrifying, as to appal any normal human being who gives it intelligent consideration. Its full extent can never be fully visualized. The human mind cannot grasp it all. But if you wish to try, you will find in this volume a wealth of figures and statements, estimates and judgments, all as authoritative as can be procured, and you will have to tax your mental powers to the utmost to appreciate the terrible effect of the World War alone on the human race.

That the world today is facing a conflict even greater than the last major struggle seems certain. If you think any good will come of it, you should read the analysis made by these ten women on the results of the last one, and you may believe their statement that "it is now certain no benefit will accrue to any nation involved in war hereafter that will equal the calamitous price paid for it, . . . for the next war is bound to result in the most titanic disaster within the experience of the human race!"

Wars must cease because if we do not destroy war now, war will destroy us, declares Carrie Chapman Catt; because the war idea is obsolete, says Mrs. F. D. Roosevelt; because wars waste human life, Mary E. Woolley proves to our horror; because wars cost too much, Mrs. William Brown Meloney shows us; because wars produce economic chaos, argues Florence Brewer Boeckel; because in war you never know what you are fighting for, writes Emily Newell Blair; because wars unleash demoralizing instincts, Judge Florence E. Allen assures us; because war breeds war, Dr. Alice Hamilton points out; and because wars interfere with the normal growth of civilization, Jane Addams graphically reveals.

Granted that we are convinced of the futility of war, what can be done to prevent it? After all, that is the important question. Jane Addams declares that "man has learned to grow his food with one-tenth the labor formerly required, and possesses in technical knowledge, in energy of men and machines, and in raw mate-

rials enough to give security and leisure to all those now living on the planet." Because of this, the venerable founder of Hull House thinks, "It has therefore become a deeper disgrace than ever before that men should be starving in the midst of plenty . . .and that the relationships to his fellow men, upon which distribution depends, are still so ill-adjusted that dearth continues and even increases."

She believes correction of this sad state of affairs can come only through international cooperation, and implores men to have faith in one another and in their common purposes to consummate this great task.

In the last chapter of this absorbing, startling, informative book, Dorothy Canfield Fisher concludes that "Nobody can doubt the soundness of the proofs set forth in this volume, of the idiotic, purposeless destructiveness—what one might call the murderous inanity of war.

"As completely as modern hygiene has proved that filth, disease germs, bad food and too much alcohol are harmful to bodily health," she continues, "these facts and figures prove that ordinary horse sense is revolted by the cosmic wastefulness of war, that common decency is horrified by it, that everyone of the higher qualiites of our nature recoils from it."

In asking why this "damnable institution continues to threaten our lives," she blames it on human stupidity, the thick-witted human capacity to resist obvious proofs that a deeply-rooted tradition is false. Miss Fisher praises President Roosevelt's definition of a defensive war as one in which a country's army and navy are within its own bounds. She castigates the use of war as an "escape mechanism" for discouraged, economically hopeless people who, for one hour of imitation greatness, must pay with years of misery and lowered vitality, with hideous dehumanizing memories, with shame, with drab hopelessness, far worse than anything they had known before, and the last sentence in the book reminds us that:

"A nation should call itself disgraced if it so orders life within its borders that there can be even one of its citizens living so poorly, so unbeautifully, so hopelessly, that war—*war!*—can even for an hour seem a change for the better!"

This small volume of 157 pages is packed with meat, interestingly written and well edited. If one can read it and not be convinced that war is a mass mania for suicide and that it can lead only to ruin, then he is so callous and abnormal in his human instincts as to warrant a sanity examination. It lacks only photographs depicting the stark horrors of war in all its gruesomeness to make it a perfect appeal to mind and eye. As it is, there could be presented no better argument to the intelligence than this symposium compiled under the auspices of the National Committee on the Cause and Cure of War.

—Roy M. Frisen

Chinese Government, By Kalfred Dip Lum, Ph.D. The Mercury Press, Shanghai, China.

The world has had a large share of its attention focused upon China for some years past, and indications are that it will increase in the near future. Many millions of words reporting the situation there have gone out of China to be printed in newspapers and magazines the world over. Referenecs made to Chinese governmental agencies and officials have in most cases, it is probable, left no clear picture in the reader's mind of their relative importance and functions.

The Chinese system of government is so different from the various forms familiar to most readers of the English language that unless they have some knowledge of its fundamentals they cannot hope fully to understand the machinery that is brought into play to cope with the monumental problems harassing the nation.

Since an appreciation of Chinese psychology is essential to an appreciation of the profound changes now taking place in the Far East, and since a people's mental processes can to some extent be gauged by the form of government under which they live, the person who informs himself of China's peculiar governmental structure is doubly benefited.

Dr. Lum's description of his country's government from its earliest days to the present is complete, yet briefly treated. It is well written, save for an occasional quaint sentence construction, is easily read, and strange as it might seem of such subject matter, is interesting reading. Thus it is possible readily to gain a practical understanding of China's governmental set-up without expending a great deal of time and energy. The knowledge obtained should materially increase the reader's ability to comprehend the process by which a huge national population is being guided through one of the critical periods that mark its long history.

Four appendices contain The Fundamentals of National Reconstruction, by Sun Wen(Dr. Sun Yat Sen); The Organic Law of China; The Provisional Constitution; and a Select Bibliography, to round out a well-planned treatise. The volume is indexed and covers but 177 pages of large print.

Well known for his work at the University of Hawaii, Dr. Lum is a Visiting Professor of Government and International Relations at New York University, and is Commissioner of Overseas Affairs for the Republic of China. His eminence in the field of which he writes is sufficient assurance of the reliability of his work.

—Roy M. Frisen

The Chinese—Their History and Culture, By Kenneth Scott Latourette, Professor of Missions and Oriental History, Yale Univ., 2nd Edition Revised. 2 Volumes in one, Macmillan, New York. 900 pp. $5.

A record of China and its "mixed peoples," chronicled by a recognized authority. It is a handbook of two volumes masterfully prepared with each chapter devoted to a distinct phase of that country's complex evolution.

The author paints an unbroken picture of China from her remote historical period to the present time, and discusses in considerable detail its religions, culture, geography, invasions, dynasties and social orders, all potent factors in the shaping of China's destiny.

An extensive Bibliography, a detailed Index and a large map of China help materially to make this book one of the most complete histories of China yet to appear.

—Peter E. Chu

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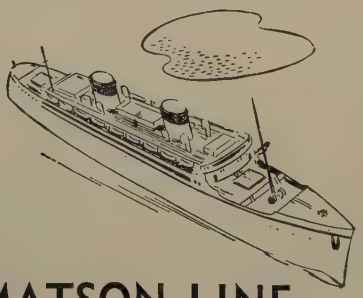

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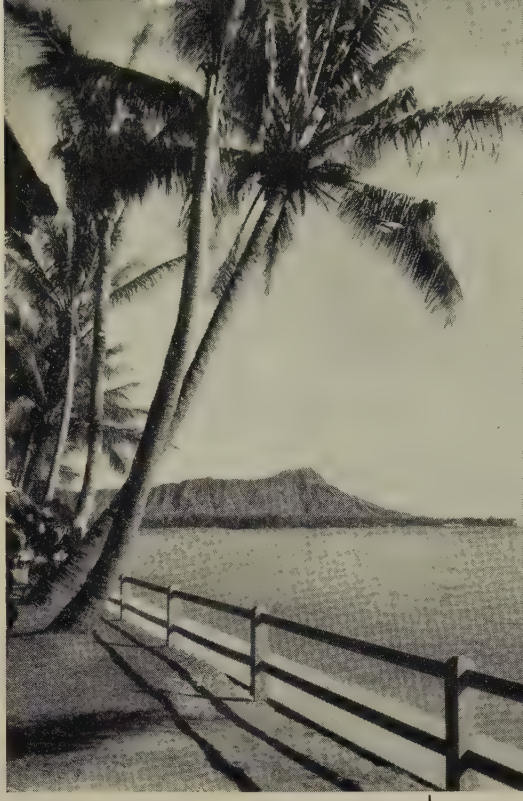

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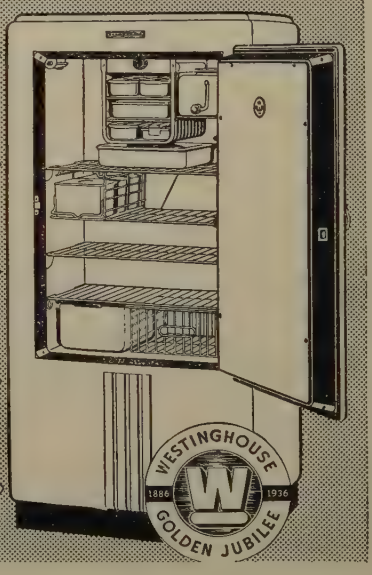

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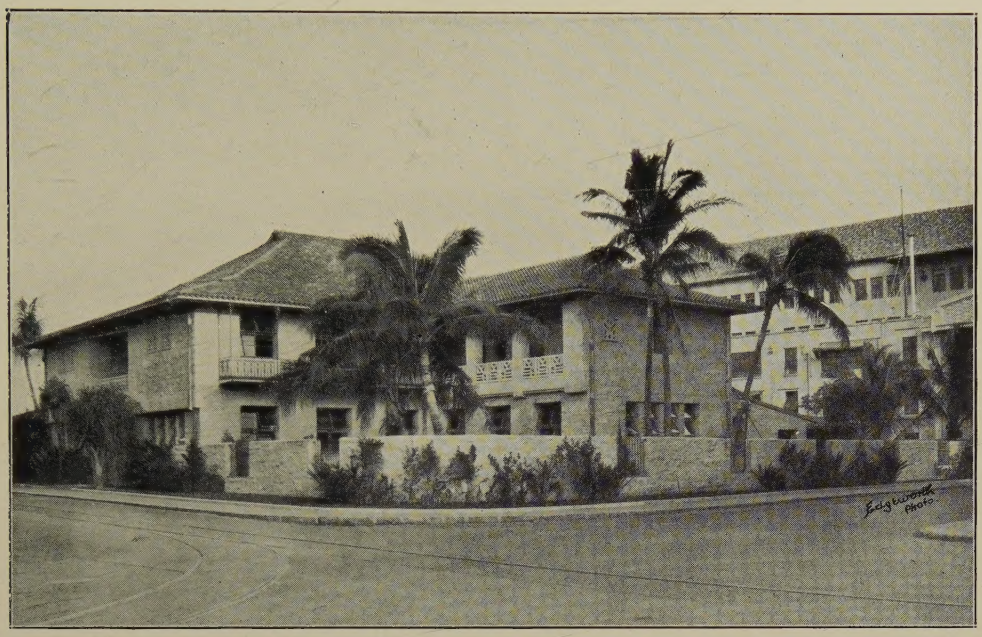

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THE PEOPLE OF HAWAII

to enable you to obtain accurate information on any subject concerning the entire Territory of Hawaii, U. S. A.

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Peace is something to fight for; war is something to fight against. So, Mr. Average Citizen, wield that tremendous power of yours! Let jingoistic politicians, big-navy lobbies, war-fomenting papers, feel the might of your wrath.

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Civilization must build its own defense out of human reason and intelligence, properly organized and applied.

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